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Vol. XXIII, No. 8 AUGUST, 1934

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 83rd ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN PORTLAND, ORE., IN 1935.

The 1935 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Portland.

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E. F. KELLY, Secretary,
2215 Constitution Ave.,
Washington, D. C.

THE FOUNDING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

PRESIDENT ROBERT P. FISCHELIS, in addressing the New Jersey pharmacists, who were registered on June 28th, used as a text the code of ethics formulated at the time of the organization of the AMERICAN PHARMACEUTICAL ASSOCIATION. It has been a practice for several years to have the Governor of New Jersey present the Certificates of Registration and have members of the Board and other pharmacists present. The ceremonies should and doubtless do impress the young pharmacists with their responsibilities and the citizens gain confidence from the evidence of regard in which pharmacists hold their profession. The code of ethics adopted in 1851 follows:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated or deteriorated drugs and by detecting and exposing home adulterations.
2. To encourage such proper relations among Pharmacists, Druggists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.
3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Pharmacists and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, encouraging home production and manufacture in the several departments of the drug business.
4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.
5. To suppress empiricism, and to restrict the dispensing and sales of medicines to regularly educated Pharmacists and Druggists.
6. To uphold standard of authority in the Education, Theory and Practice of Pharmacy.
7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

President Fischelis continued:

"That was in 1851. If we were to ask any group of practicing pharmacists to-day to list the important problems confronting the profession they would unhesitatingly mention every one of the objectives which the organizers of the AMERICAN PHARMACEUTICAL ASSOCIATION set out to attain in 1851. This does not mean that there has been no progress in eighty-three years. It does mean, however, that the tasks set by our professional forebears have not yet been completed. You who are to receive the sanction of the state to practice pharmacy this morning are therefore entering a field of activity in which much remains to be done. In some respects this is very fortunate for you because you will be stimulated by the challenge of unsolved problems and unfinished tasks, and if you can survive the stress of the times, economically, I am sure that you will contribute to the continuation of the steady and sound progress which has been made through the decades immediately preceding.

"The pharmacists who met in New York in 1851 formed the AMERICAN PHARMACEUTICAL ASSOCIATION which has not only become the outstanding spokesman for the pharmaceutical profession in the United States but has been directly or indirectly responsible for the formation of our state pharmaceutical associations and the various national associations serving specialized fields of pharmaceutical practice such as manufacturing, wholesaling, teaching, etc. In short, it is the Mother of Pharmaceutical Associations in America."

F. V. McCULLOUGH.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXIII AUGUST, 1934 No. 8

FRANK V. McCULLOUGH.

Frank V. McCullough, president of the Conference of Pharmaceutical Association Secretaries for 1934–1935, is a native of the Hoosier State. He was born in 1880, reared on a farm and after his earlier education taught in a rural school. He entered Purdue University School of Pharmacy, receiving his diploma from that institution in 1905. Thereafter he engaged as clerk in a drug store and from 1907 to 1929 he operated a pharmacy in New Albany, Ind. For two years he was a member of H. K. Mulford Sales force, doing detail work in Louisville territory.

In 1927, Mr. McCullough was elected full-time secretary of Indiana Pharmaceutical Association and has served in that capacity since then and also as editor of the *Indiana Pharmacist.*

He takes an active interest in civic affairs and served as member of New Albany City Council for eight years, as county chairman for six years and secretary of the Congressional District organization for two years.

Mr. and Mrs. McCullough were married in 1906, they have one son.

OFFICERS OF CONFERENCE PHARMACEUTICAL ASSOCIATION SECRETARIES.

President, F. B. McCullough, New Albany, Ind.; *First Vice-President,* J. W. Slocum, Indianola, Io.; *Second Vice-President,* Roy C. Reese, Topeka, Kans.; *Secretary-Treasurer,* Carl G. A. Harring, 20 Glen Road, Newton Center, Mass.; *Delegate to the House of Delegates,* C. J. Clayton, Denver, Colo.; *Members of the Executive Committee,* J. Lester Hayman, Morgantown, W. Va., J. J. Gill, Providence, R. I.; Roy Reese, Topeka, Kans.; W. E. Bingham,[1] Tuscaloosa, Ala.; *Place of 1935 Meeting,* Portland, Ore.

[1] Deceased July 10, 1934.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

THE MISSION OF PROFESSIONS.

A potent measure in bringing about an understanding of the mission of professions is reasonable, rational discussion, with the purpose of devising the best means for being of service to the public. The Pharmacopœia, the National Formulary, "New and Nonofficial Remedies" influence pharmaceutical and medical practice and, reversely, medical and pharmaceutical thought are developed by acquaintance with the standards. The attitude of medical practice toward individual drugs should be based on clinical confidence, and the activities of pharmacy should represent the thoughts developed by research in the field of medicine, dentistry and the divisions of pharmaceutical practice and of related sciences.

Dr. Lewellys Barker, speaking before the Section of Pharmacology and Therapeutics of the American Medical Association, said "Pharmacotherapy is seen at its best when, through the use of a drug, the cause of a disease is removed or rendered harmless (etiologic pharmacotherapy) before the patient has sustained irreparable injuries. The organism can then right itself, so that its activities can resume the normal or physiologic course." Neither the Pharmacopœia nor the National Formulary meet all the requirements of medicine and pharmacy, and as a result the "New and Nonofficial Formulas," "Useful Remedies," hospital and dental formularies and the "Recipe Book" issued under authority of representative organizations find a worthy place in the libraries, laboratories and respective professional work rooms.

Gratifying progress is being made through coöperative efforts of the members of the several professions. The American Medical Association had a display in its scientific section at its recent meeting in Cleveland acquainting its members with the officials of the standards and the preparations representing these drugs. The motive of the United States Pharmacopœia booth was the use of the Pharmacopœia in hospital practice and its adaptability to the needs of the practicing physician; in that connection the rules formulated by the New York Hospital, Cornell University Medical College, were brought to the attention of physicians; these may be found in the December JOURNAL, A. PH. A., 1933, page 1281.

Recently a formulary of U. S. P. and N. F. drugs and preparations has been issued under the auspices of the Philadelphia County Medical Society with the endorsement and coöperation of the Pennsylvania Pharmaceutical Association and the director of the Emergency Relief of Pennsylvania.

Splendid work has been done by local associations in bringing into coöperation physicians, dentists and pharmacists, and is evidence of serious thought to raise the professional standard of pharmacy and determination to meet the responsibilities and opportunities in supplying the official preparations. The papers of all of the Sections of the AMERICAN PHARMACEUTICAL ASSOCIATION show the trend and a number of them, printed in this issue of the JOURNAL, detail the practice followed by pharmacists and the measure of success achieved by them.

Manufacturing pharmacists and chemists have rendered and are engaged in developing and perfecting useful materia medica and their interests as those of medicine, pharmacy and chemistry are largely common interests; in a sense and in degree the work of one branch is incomplete without the other, and full measure of credit is dependent on the recognition of all of them in the welfare of those they serve.

Every divisional activity seeks the opportunity for advancement and rendering better service which will gain higher esteem; likewise, there are shortcomings in one way or another, when mutual consideration would result in general good. In these columns it has been cited on other occasions that pharmacy has been somewhat over-shadowed by an over-emphasis of the commercial features in some drug stores; as a result, the public has not gained the significance of the professional value of pharmacy, for public opinion is shaped by publicity—pharmacy can be denounced or its importance pronounced—made known by printed word and by the appearance and activities of the drug store. Every pharmacist owes it to himself and to pharmacy to aid in acquainting the public with the service rendered by pharmacy and its importance. Every opportunity that will lend itself to the purpose should be utilized to acquaint the public with the part pharmacy has in public health service, by informing the people that pharmacists have been the chief exponents of regulations applying to the profession, for its protection against misuse of drugs, and seriously engaged in the development of a materia medica which enables medical men to make the best use of it. The earnestness of this coöperation is shown by the growing interest in the discussions and exhibits to the end that therapy may be improved; that among the drugs there are agents which can be employed by physicians with confidence and reasonable expectancy of results. Pharmacists are concerned, and their part in the work is not only to supply remedial agents, but also to see that preparations are supplied which represent them most effectively—that is a mission of pharmacy.

THE CHAIRMAN'S ADDRESS OF THE BRITISH PHARMACEUTICAL CONFERENCE.

THE chairman of the British Pharmaceutical Conference, as is well known, does not discuss varied phases of pharmacy but usually selects for his address a subject with which he has been engaged. Thus, Chairman C. H. Hampshire selected for his discussion "Pharmacopœias and Formularies." *The Pharmaceutical Journal*, speaking editorially, said: "As Secretary to the British Pharmacopœia Commission he must live most of his life in, as it were, a pharmacopœial atmosphere, where the most important changes are those caused by the advent of foreign and the revision of British Pharmacopœias."

The chairman reviews briefly the pharmacopœias of recent revision: The British, Italian, Belgian, Spanish, Danish, Swiss, Yugoslavian, Hungarian, United States, and then discusses the Agreement which resulted from the deliberations of the Second International Conference, held in 1925. The Agreement consists of forty-one Articles, which give consideration or approval to principles of the prepara-

tion of galenicals, a definition of a standard dropper, nomenclature, maximum doses, poison table, etc.

The chairman refers to formularies which have been published—the National Formulary, the British Pharmaceutical Codex, the German Ergänzungsbuch, the Canadian and the Australian Formulary.

The closing theme, while addressed to British pharmacists, has thoughts which have bearing on our own activities. Without comment the paragraphs referred to are quoted:

"The theme of this address, like that of many others delivered from this Chair, leads to the subject of pharmaceutical research. The materials for the construction of pharmacopœias and formularies, provided largely by the papers contributed to this Conference, have proved of value in suggesting subjects to those desirous of contributing something to the sum of pharmaceutical knowledge, and one is led to inquire whether there are any possible extensions of the usefulness of the Conference in stimulating research. The organization of coöperative investigations suggests itself as a sphere in which the Conference might carry out valuable work. There are many subjects, particularly the standardizing of the technique of analytical methods and processes of manufacture, which are best investigated by groups of workers who are prepared to experiment with identical material and to pool results.

"The recent work done by a Committee of the Health organization of the League of Nations in standardizing the technique of the assay of opium provides another instance of successful effort on these lines. The formation of the investigating Commissions by the Second International Conference to which reference has been made, indicates the appreciation by that assembly of the value of such methods. Much good work of this kind was also done by the voluntary efforts of Sub-Committees of the British Pharmacopœia Commission with results which were eventually included in the British Pharmacopœia 1932, and it is hoped that similar efforts will continue with much benefit in increasing the value of the Pharmacopœia as a book of standards.

"The range could be widened, however, and all works of reference would be enriched and increased in value by the inclusion of precise and accurate methods. There is need for a central organization which will undertake the collection and distribution of material, the comparison of results and the publication of agreed recommendations. I venture to suggest that this Conference might well add to its service to pharmaceutical science by acting, through a Research Committee appointed for the purpose, as an organizing body in relation to pharmaceutical investigation."

In an earlier editorial of the same publication it was asked: "Would it be too much to hope that when the Society's (British) new building is erected part will be set aside as the headquarters of pharmaceutical investigations, a National Institute for Pharmaceutical Research, at which inquiries into the pharmaceutical aspects of problems affecting the health of the nation can be made?" The editorial concludes that there was no evident reason why the Society should not provide a research laboratory adequately equipped for its needs.

PRICE-FIXING UNDER THE NRA.

RUSSELL OWEN in discussing various phases of the NRA in the *New York Times* of August 5th, states that nearly all groups have tried to live up to the codes. The price-fixing regulations were dropped partly because some industries could not live under them and pay a living wage and because of the difficulties of the enforcement. There was difficulty in enforcing the fair practice and price-fixing regulations in the service codes, but there have been requests for reimposing emergency price-fixing to prevent price-cutting and unfair competition. It is difficult

or impossible to regulate one group of industries by rules which may not apply fairly to another group.

The probability of a merger of the Federal Trades Commission with the NRA is discussed by Mr. Owen in the following closing paragraphs:

"When General Johnson rewrites the NRA—as he will probably do very soon—some merger of these two bodies will be recommended. Since the Trade Commission was created by Congress, Congressional action will be necessary to abolish it, but its functions may be taken over by NRA by Presidential order.

"There are those close to the President who believe that this will be done in the Fall, and that the new NRA, stimulator and restrainer of industry at the same time, will start out on a new field of activity which will firmly implant it in the nation's economic system. With all its faults, they say, there are few industrialists or labor leaders who want to see it entirely destroyed."

THE 1934 U. S. P. EXHIBIT AT THE CONVENTION OF THE AMERICAN MEDICAL ASSOCIATION.

The United States Pharmacopœial Convention authorized the School of Pharmacy of Western Reserve University to prepare a booth on the United States Pharmacopœia for the American Medical Association convention June 11 to 15, 1934, in Cleveland.

U. S. P. Exhibit, Cleveland meeting of American Medical Association.

The booth was located in the Scientific Section beside that of the AMERICAN PHARMACEUTICAL ASSOCIATION on the National Formulary. Across the aisle the School of Pharmacy had its booth on the medicinal plant garden and its work in hospital pharmacy.

The prescriptions of the booklet distributed—"The U. S. Pharmacopœia and Your Prescription"—were written upon placards and placed on the walls of the booth. Beneath the placards small brackets were fastened to the walls containing bottles of the filled prescriptions.

The interest in the displays was very marked and was extremely satisfactory to those in charge of the booths. Rarely were there less than five people at the booth at any one time.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins, George D. Beal, L. W. Rising, H. M. Burlage, L. W. Rowe, John C. Krantz, Jr., Heber W. Youngken.

SALIVA TESTS. I. MORPHINE.*

BY JAMES C. MUNCH.[1]

The formation and secretion of saliva by the parotid, submaxillary and sublingual glands have been shown to be controlled by the nucleus salivoratus in the upper pons (21, 34, 59). The secretion is readily augmented by sensory stimuli, readily depressed by narcotics. Since the volume of saliva excreted daily by man normally amounts to 1000–1500 cc. and may be markedly increased, this pathway for excretion of foreign substances appears to deserve study.

It is reported that toad and cobra venoms are excreted in the saliva, as well as the virus of rabies and of mumps (5, 6, 7).

Rosenthal (5, 6) in 1893 appears to have been the first to demonstrate that morphine is eliminated in the saliva. Therapeutic doses were given to a number of hospital patients. The saliva was collected at half-hour intervals, and tested chemically with iodic acid, Husemann's and Froehde's reagents. Saliva from a number of normal and pathological individuals not receiving morphine or opium alkaloids gave uniformly negative results. When 19 mg. were administered daily, saliva tests were negative on the first and second days, then positive until one or two days after the morphine was discontinued. The saliva was estimated to contain between 0.05 and 0.2 mg. of morphine.

A detailed series of experiments on the excretion of medicinal substances by the salivary glands were conducted by Howe (23). Gelatin capsules containing test products were given by mouth and the saliva collected every five minutes for several hours. Many products appeared in the saliva within twenty minutes, and their presence was continually detected over a period of nine hours, but not after twenty-four hours. Attempts have been made to correlate the salivary excretion of NaCNS and KCNS.

The following products have been reported to be excreted in the saliva: Aconitine, amino-acids, ammonium compounds, arecoline, atropine, bismuth salts, bromides, brucine, chlorides, chlorates, creatinine, formic acid, glucose, guaiacol cinnamate, histamine, indican, iodides, iron salts, lead salts, menthol, mercury salts, methenamine, morphine, oil of peppermint, ouabain, potassium salts, quinine, salol, sodium benzoate, sodium salicylate, sodium sulphate, strophanthin, strychnine, thiocyanates, tyramine, urea and uric acid. The following are reported as not excreted in the saliva: Atropine, physostigmine, sodium ferrocyanide and sodium lactate (2, 3, 5, 6, 7, 9, 10, 11, 13, 16, 17, 19, 23, 24, 33, 37, 39, 43, 44, 45, 48, 53, 55, 57, 61, 62, 63, 66, 67, 70, 72, 74).

Saliva tests were developed to detect the "doping" of race-horses. Stimulants have been given to race-horses to obtain better (or poorer) performances. Varron

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* Scientific Section, A. PH. A., Washington meeting, 1934.

[1] Director Pharmacological Research, Sharp and Dohme, Glen Olden, Penna.

(69), in 1533, reports that anise seed, honey and sandarach were given to race-horses, as stimulants. An English regulation dated June 14, 1666, prohibited the use of exciting substances and methods in races run at Worksop (50). The prohibition of doping has been the subject of various circulars and regulations by racing authorities in Argentine, Austria-Hungary, Belgium, Brazil, Chile, Czechoslovakia, Denmark, England, France, Germany, Italy, Poland, Spain and United States (12, 65). Published information (8, 12, 18, 27, 28, 29, 35) indicates that horses may be stimulated with alcohol, atropine, brucine, caffeine, cocaine, digitalis, heroin, kola nut, nitroglycerin, nux vomica, quinine, scopolamine, strychnine and veratrine. Thoroughbred horses are more sensitive to the action of drugs than ordinary work horses (15). Strychnine and cocaine have been used to dope hares for sport in England (32).

The parotid gland of a horse weighs about 400 Gm., the submaxillary 86 Gm. and sublingual 23 Gm. By cannulating Stensen's duct, 100 to 700 Gm. of saliva have been collected from a horse in 15 minutes (54).

Professor S. Fraenkel, of Vienna, apparently made the first scientific study of the detection of doping race-horses. Theobromine was apparently suggested as the "dope." Studies were made of excretion in the sweat, feces and urine (35, 73) but it appeared that the saliva was the most feasible medium for examination (14). Professor Kaufmann developed a specific chemical technique for testing saliva under race-track conditions (3, 4, 27, 28, 29, 71). Based upon his tests, the winners of several large races were disqualified and barred from tracks. Neuter (47) states that doping was very common in Belgium. Shortly before the World War, chickens of the guardian of the race-track of Stokel invariably died after pecking at the dung of competitors of the previous day.

A technique for collecting saliva was developed in France (12). A veterinarian, a representative of the Racing Commission and an assistant lead the horse into a box-stall. The veterinarian washes his hands in soap and water, then 95 per cent alcohol and dons sterile gloves. A wad of sterile gauze moistened in distilled water is introduced into the mouth of the horse and squeezed over the surface of tongue and lips, the escaping fluid being caught in the collecting basin. The tongue, lips and cheeks are then wiped with another piece of gauze. An attempt is made to express any saliva from the Wharton canals. The gauze and gloves are then placed in a jar, sometimes covered with alcohol, and sealed to prevent tampering with the sample.

Chemical methods of detection have been employed with only partial success. The method of Fraenkel (14) slightly modified by Lander (36) appears to be an improvement over the standard toxicological processes (1, 49). The saliva is extracted several times with 90 per cent alcohol, plus dilute acetic acid; the filtrate evaporated and extracted with ether. This is evaporated to a tacky consistency and exhausted with small amounts of warm absolute alcohol. The alcohol is removed and the residue dissolved in hydrochloric acid. This solution is made alkaline with sodium bicarbonate and extracted with chloroform and benzene. With iodine and Mayer's reagents the limit of sensitivity by morphine was 0.01 mg.; with phosphomolybdic acid and gold chloride, 0.001 mg., and with tannic acid 0.02 mg.

Chemical methods of procedure may fail in instances where threshold amounts of stimulants have been administered. Because tests upon animals are more sensi-

tive, a series of investigations were undertaken to determine their sensitivity for various stimulants which may be used on race-horses. Only the results obtained with morphine are reported in this communication.

Consideration of the bioassays for morphine (46) suggested the possibility of using the "mouse-tail reaction" (Mäuseschwanzphänomens) developed by Straub (64). Mice weighing 15 to 20 Gm. are injected with 0.5 cc. of test solution under the skin of the back or abdomen. If morphine is present the tail soon curves over the back in a characteristic S-curve. On stimulation, the mouse becomes somewhat restless, paresis of the posterior extremities becomes more noticeable, the back is humped and the fur stands out in a disheveled, shaggy manner. The mechanism of this reaction is still unsettled (20, 22, 25, 26, 30, 31, 38, 40, 41, 42, 51, 56, 58, 60, 64, 68). Other alkaloids may give a somewhat similar response, but different symptoms are produced. Positive reactions may be obtained with doses of 0.01 mg. of morphine and heroin (46, 56) to 0.02 mg. (42) amounts which are far below the sensitivity of chemical procedures on an extract of an organ or on the saliva.

Van Rijn (56) reported in 1914 on twenty-five cases of morphine poisoning. A corpse was examined and extracts of viscera prepared 59 days after death and again 38 days later. The extracted morphine injected subcutaneously under the skin of the back of white mice caused their tails to become stiffly erect in S-shape curves in two to twenty minutes.

Maier (42) injected 10 mice at each of a series of increasing doses, from 0.01 mg. per 20-Gm. mouse to 0.50 mg. per 20 Gm. (0.5 to 25 mg. per Kg.) (Table I). The animals showing a questionable reaction were divided arbitrarily, half being considered positive and half negative. A definite relationship was found between the dose administered and the duration of the reaction, but this relationship was not as close as the dose:percentage response relationship. Using the factors of duration and percentage, he tested a series of samples of unknown potency, obtaining results which, in general, were ten per cent less than theory. He concluded that this method was suitable for legal and toxicological assays, and had a sensitivity of 0.02 mg. of morphine, an amount much less than could be determined by chemical methods. Keil and Kluge (31) confirmed the nature of the dose percentage and dose:time relationships, using 100 mice at each dose from 1/100 mg. of morphine hydrochloride per 10-Gm. body weight, down to 1/40 mg. (1 to 2.5 mg. per Kilo) (Table I). Solutions containing amounts of morphine unknown to the investigator at the time assays were made, were tested with an average error of 6 per cent by the dose:percentage reaction, and 2 per cent by the dose:time reaction, or an average of 4 per cent. For the determination of morphine, 0.0125 mg. can be determined with an accuracy of about 5 per cent.

A review of the literature showed that about 0.01 mg. of morphine may be detected with an accuracy of five per cent by means of the tail reaction of white mice.

EXPERIMENTS.

In my investigational work preliminary experiments showed that the presence of morphine dissolving in saliva could be detected by the mouse-tail method with the same precision as when morphine had been dissolved in distilled water. A large number of tests with differing doses of morphine led to the development of a

specific technique for this test. It did not alter experimental results to inject solutions under the skin of the abdomen rather than under the skin of the back, as recommended by previous workers. The volume of injected solution did not make much difference in the nature of morphine response produced, but for uniformity it was decided to inject approximately 25 cc. of solution per kilo, which corresponds to 0.5 cc. for a 20-Gm. mouse. In those instances where weak solutions were tested and larger volumes injected up to 4 cc. per 20-Gm. mouse, dependable results were still obtainable, although a somewhat longer time period was usually necessary for the development of the characteristic phenomena.

After injection the mice were placed in individual cages in a quiet place and observed every minute or so for a period of half an hour. It was arbitrarily decided to fix a time period for reading the results of the injection as fifteen to twenty minutes after injection. Those animals which showed positive reactions in five minutes, for example, still showed a positive reaction in fifteen to twenty minutes. On the other hand, those animals which showed uncertain responses in fifteen to twenty minutes and gave questionably positive reactions in half an hour when injected with a given dose usually failed to show a consistent response in subsequent trials with the same quantity given to the same animal.

The degree of response varied with the dose of morphine injected: (1) Doses below the accepted threshold gave evidence of somewhat increased irritability and alterations in respiratory rate; the tail did not leave the ground voluntarily or after stimulation of the back. These responses were noted, but considered negative. (2) Threshold doses producing the satisfactory response caused definite alterations in respiratory rate. The mice tended to stand with the back arched and head depressed. When they were gently stimulated by a current of air or stroking the back with a lead pencil, the back became more arched. The hair tended to stand out in a shaggy manner. The posterior limbs showed rapid fibrillary twitchings tending toward paresis and the tail was lifted from the floor of the cage to or toward a definite S-curve. After the stimulus was discontinued, the tail reaction and the appearance of the posterior extremities extended for several seconds to several minutes. (3) When a supramaximal dose was administered, a very rapid development of the characteristic symptoms was followed by marked apnea, the fibrillations tending to extend to the anterior portions of the injected animals and the tail response developing normally without external stimulus and persisted for some time. In conformity with the literature findings, the duration of the effect was roughly proportional to the dose administered. One mouse in Fig. 1 shows the supramaximal effect, another shows the threshold.

Fig. 1.—Tail response of mice after injection of morphine derivatives.

The procedure, based on my experiments, was outlined: Weigh a series of mice of either sex with an accuracy of one gram; inject morphine solution in a dose of approximately 25 cc. per kilo subcutaneously under the skin of the abdomen; place injected animals in a quiet place. Between fifteen and twenty minutes after

injection of the threshold dose gentle stimulation produces arching of the back, posterior partial paresis and elevation of the tail to or toward an S-curve. A number of animals (at least ten) should be injected, after preliminary tests have indicated an approximate threshold concentration. Animals should show a positive response within 15–20 minutes in determining the threshold dose.

In applying this procedure to the determination in the saliva of horses, a series of trials have been made. Collections of about 2 cc. of saliva from each of fifty horses not injected with morphine were made; 1 cc. and, in many instances, 2 cc. of each saliva were injected by the method outlined, and no response obtained. This appears to justify the conclusion that the normal saliva of a horse not injected with morphine does not give symptoms suggesting a tail reaction. A series of doses of morphine, ranging from 100 mg. to 1 Gm. per horse were then injected; in general, the horses weighed about one thousand pounds. Typical results of this test are given in Table II.

No chemical tests were made upon the samples of saliva. In each instance a control sample of saliva was collected immediately before the injection, then saliva samples taken fifteen minutes and thirty minutes after injection. In some instances samples of saliva were collected at periods greater than thirty minutes after injection, but in general, the results obtained with them were in agreement with the results obtained at the thirty-minute interval. Injection of saliva in the pre-

TABLE I.—MOUSE-TAIL RESPONSES AFTER INJECTION OF MORPHINE; LITERATURE DATA REARRANGED.

Dose Mg./Kg.	Per Cent of Mice Showing Positive Reactions. Maier.	Keil & Kluge.	Munch.
0.5	16	..	...
1.0	53	..	0
1.11	...	8	...
1.25	...	20	1
1.43	...	39	...
1.67	...	60	5
2.0	79	85	10
2.5	91	..	20
3.0	100	..	31
4.0	...	..	40
5.0	100	..	65
6.0	...	..	90
7.0	...	..	100

TABLE II.—TYPICAL PROTOCOL: MOUSE-TAIL TEST ON HORSE SALIVA.

Horse No.	Amount Morphine. Mg. per Horse.	Mg./Kg.	Results of Saliva Collected Various Periods after Injection. 0 Min.	15 Min.	30 Min.	45 Min.	60 Min.
141	100	0.22	Neg.	Neg.	Neg.	Pos.	..
9325	200	0.45	Neg.	Pos.	Pos.	Pos.	Pos.
9971*	200	0.45	Neg.	Pos.	Pos.	Pos.	Pos.
9949	250	0.55	Neg.	Neg.	Pos.	..	..
9112*	300	0.66	Neg.	Neg.	Pos.	Neg.	Pos.
9326	400	0.88	Neg.	Pos.	Pos.	Pos.	Pos.
9975	500	1.10	Neg.	Neg.	Pos.	..	..
9321*	800	1.75	Neg.	Pos.	Pos.	Pos.	Pos.
X	1000	2.20	Neg.	Pos.	Pos.	Pos.	Pos.

* 1/4 grain arecoline.

liminary tests was made in doses of 0.25, 0.5 and 1 cc. into each of three mice. Based upon these results, further samples were injected in proper dilutions, as indicated.

No effort was made to follow through a complete collection of saliva at various intervals after injection in order to obtain the absolute amount of morphine quantitatively eliminated in the saliva. This rather complicated problem is being considered and will be reported subsequently. No difficulty was encountered in detecting morphine in the saliva of horses that had received subcutaneous injections of 100 mg. of morphine sulphate per 1000 pounds of horse (approximately 0.2 mg. per kilo body weight of horse, or $1^1/_2$ grains of morphine sulphate per horse). The therapeutic dose of morphine for a horse (15) is listed as 0.3 to 0.6 Gm. It would, therefore, appear that after the administration of large therapeutic doses of morphine its presence might be detected in the saliva over a period of half an hour. Doses of morphine suggested for "doping" race-horses correspond to 3 to 5 grains of morphine sulphate per horse, amounts which may be detected by this procedure, even without attempting to concentrate the saliva. If the saliva is concentrated by chemical procedure, the sensitivity may be greatly increased. The administration of $^1/_4$ grain of arecoline per horse increased salivation, but did not appear to affect the elimination of morphine.

CONCLUSIONS.

1. Morphine may be quantitatively determined by the mouse-tail reaction.
2. The amounts used in "doping" race-horses can be readily detected in the saliva fifteen and thirty minutes after administration.
3. A standardized technique has been developed for this test.

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ABSTRACT OF DISCUSSION.

W. B. D. Penniman said he would discuss this report by Dr. Munch, in view of the fact that we are collaborating on this race-track work, to a certain extent: "It must be remembered that the collection of saliva from a race-horse is not a quantitative procedure, although a specific technique has been developed for this purpose. The race-horse is most emphatically *not* a laboratory animal. After the sample is obtained the toxicological difficulties develop because of the presence of iron from the bit, traces of blood and other substances which may interfere with our tests. By a chemical method I have succeeded in detecting or identifying fractions of a mg. of the morphine alkaloids, caffeine, strychnine and cocaine. These are only four of the substances which we have to seek. Everybody who has worked on this subject to date seems disposed to keep it a secret. If any chemist or any pharmacologist is interested in this matter, I know I am speaking for Dr. Munch as well as my own organization, in saying we will be glad to confer with them and get, as well as give any possible assistance. In making saliva tests at this time, the chemist is in a little better shape than the pharmacologist. Tests upon the saliva by chemical and pharmacological methods may be depended upon to show whether horses have been 'doped.'"

F. A. Upsher Smith said that this matter is of tremendous importance because when you

find harmful poisons in a horse's mouth after a race, you are questioning the honor of the men who own and train the horses: "The work Dr. Munch is doing is a credit to him and to the country, because all decent racing men will appreciate the fact that it is only the 'rotters' who are doping their horses and the good men don't want it. I would like to suggest that the perspiration from under the saddle would be a more handy substance to use than the gooey saliva. The favorite mixture for doping horses is nitroglycerin, strychnine, digitalis and heroin. Is it possible to get an accurate result between the time the horse comes back from weighing in and the time he returns to the stable?"

The author stated that the chemical methods developed by Dr. Penniman are much more sensitive than those published in the literature, and he deserves to be commended for his studies on this subject: "We are uncertain whether the chemical or biological methods are the most delicate, as well as the most specific, for testing the horse's saliva. With the animal test you get definite symptoms more rapidly than with the chemical: with the chemical method you can often isolate the specific alkaloids and identify them. The combination of both methods appears highly desirable. I have had no experience with perspiration from under the saddle, but believe that it might be contaminated with too much dirt. It is hoped that the application of these methods of chemical and biological testing will stop the doping of race-horses."

THE STABILIZATION OF SYRUP OF FERROUS IODIDE, U. S. P. X.

BY WILLIAM J. HUSA AND LYELL J. KLOTZ.

(*Concluded from page 683, July Journal.*)

As indicated in Table II, the hydrolysis of aqueous solutions of ferrous iodide corresponds predominantly to the equation:

$$FeI_2 + HOH \rightleftharpoons Fe(OH)I + HI$$

and apparently, two equilibria exist since reasonably constant values of K_1 were obtained for solutions having either a p_H of 3.2 or 4.1. In the former case, the degree of hydrolysis is approximately 0.30% at the concentration of the U. S. P. Syrup; in the latter instance, it is approximately 0.027%. Solutions of ferrous iodide of p_H 4.1 are hereafter designated as solutions at primary equilibrium; those at p_H 3.2 are considered to be at a condition of secondary equilibrium.

The Mechanism of Iodine Formation.—The decomposition of aqueous solutions of ferrous iodide consists in the formation of free iodine and ferric hydroxide. If sucrose, or other peptizing agent is present, however, ferric hydroxide does not precipitate and the appearance of iodine is dependent upon the rate at which the peptizing agent reacts with free iodine as well as upon the rate of auto-oxidation. The presence of soluble ferric ion is prohibited by the presence of iodide ion which reduces it to the ferrous state.

Several equations to account for the decomposition of ferrous iodide preparations have been advanced. Salzer (9) and Sadtler and Coblentz (10) formulated the equation

$$\text{(I)} \qquad FeI_2 + 2HOH + {}^1/_2O_2 \rightleftharpoons Fe(OH)_3 + HI + I$$

Mylius (11) suggested

$$\text{(II)} \qquad 2FeI_2 + 3O_2 + 3HOH \rightleftharpoons 2Fe(OH)_3 + I_2$$

and Bentley and Driver (12) account for the decomposition by two reactions:

$$(III) \quad 2FeI_2 + O_2 \rightleftharpoons 2FeOI + I_2$$
$$(IV) \quad FeOI + 2HOH \rightleftharpoons Fe(OH)_3 + HI$$

On the other hand, Phillips (13) believed the decomposition to result from deterioration of the hydriodic acid formed by hydrolysis of the salt; no experimental evidence was offered in support of this hypothesis.

The above equations require, from a stoichiometric standpoint, the loss of two mols of ferrous iron for each mol of free iodine formed. Equations (I) and (IV) indicate, however, that this ratio would decrease slightly as the result of subsequent deterioration of the hydriodic acid formed. Thus, the validity of these equations may be established by analyses of partially decomposed solutions of ferrous iodide, a 2:1 ratio or smaller indicating that such formulations are acceptable.

In order to determine the validity of these theories of decomposition, samples of aqueous solutions of ferrous iodide were stored under conditions of excess air, in completely filled, tightly stoppered bottles and in sealed pycnometers and the loss of ferrous iron in mols per liter compared with the free iodine present. The result of such a series of analyses upon a sample stored in the presence of air and prepared from Reagent grade chemicals follows in Table III.

TABLE III.—RATIO OF MOLARITY OF IRON AND IODINE IN AQUEOUS SOLUTION OF FERROUS IODIDE STORED AT 30° C. IN THE PRESENCE OF EXCESS AIR.

Hours.	Loss Fe^{++} Mols/L.	I_2 Mols/L.	Fe^{++}/I_2
0	.....	.....	..
172½	0.00772	0.00144	5.36
240	0.00799	0.00177	4.52
292	0.00705	0.00197	3.58
340	0.00705	0.00220	3.20
384	0.00705	0.00313	2.26
436	0.01089	0.00337	3.21
557	0.01614	0.00418	3.86
774	0.02094	0.00561	3.72
918	0.02093	0.00666	3.14
1178	0.01983	0.00897	2.21
1538	0.03675	0.01300	2.82

As indicated by the data in Table III, no evidence exists for the disappearance of 2 mols of ferrous iron per mol of iodine formed. Moreover, similar results were obtained in other samples stored in the presence of air. Samples stored in completely filled, tightly stoppered bottles apparently remained near the condition exemplified by the early readings in Table III, and ranged in ratio between 8.64 and 2.21 as determined from 11 analyses. Samples stored in sealed pycnometers, showed no loss of ferrous iron over a period of 1127 hours although they contained traces of free iodine. It was concluded that the equations previously advanced were not acceptable as representing the mechanism of decomposition.

An examination of the precipitates contained in the samples of solution stored in completely filled, tightly stoppered bottles gave some indication of basic salt formation during the early stages of decomposition. In general, however, the precipitate proved to be ferric hydroxide.

In order to test the effect of a common ion on the rate of decomposition, a solution containing 1 mol per liter of potassium iodide in addition to its ferrous

iodide content and another solution containing 0.22 mol per liter of excess ferrous sulphate were stored together with a control. Analyses for free iodine showed that the presence of either iodide or ferrous ion in excess results in an increased rate of decomposition.

The Rate of Decomposition of Ferrous Iodide Solutions.—In order to elucidate further the mechanism of decomposition of aqueous solutions of ferrous iodide, the rate and order of reaction were determined. A solution of ferrous iodide was prepared from Reagent chemicals and stored in the thermostat at 30° C. in darkness in a container with an excess of air. The progress of the decomposition was followed by titration of the liberated iodine. Results were treated mathematically according to equations (I) and (II) below, in order to determine the order of reaction (14):

$$\text{(I)} \qquad K_m = 2.303/t \log a/a - x$$
$$\text{(II)} \qquad K_b = 1/t \cdot x/a(a - x)$$

where K_m represents the specific reaction rate as calculated for a first order reaction and K_b represents that for a second order reaction. The fraction decomposed in time t is represented by x, and the initial concentration by a. All calculations are based upon the total iodide content of the preparation, thus regarding the oxygen content as sufficiently large to be considered constant. Data follow in Table IV.

TABLE IV.—RATE OF DECOMPOSITION OF FERROUS IODIDE SOLUTIONS PREPARED FROM REAGENT IRON AND REAGENT IODINE AND STORED IN THE THERMOSTAT AT 30° C. IN DARKNESS.

Total Hours.	Segment Hours.	Iodide Mols/L.	Ferrous Iron Mols/L.	Iodine Mols/L. $\times 10^3$.	$K_m \times 10^3$.	$K_b \times 10^4$.
0	0	0.22710	0.2348	...	...	..
95	95	0.22672	0.2354	0.87	4.05	1.79
148½	53½	0.22648	0.2348	1.22	1.51	4.46
215	66½	0.22710	0.2334	1.43	1.06	4.20
263	48	0.22680	0.2244	1.63	0.98	6.65
315½	82½	0.22672	0.2263	1.83	1.74	6.86
359	43½	0.22680	0.2263	1.99	1.74	8.98
411	52	0.22651	0.2263	2.72	1.80	10.29
532	121	0.22694	0.2244	3.41	1.32	5.57
719	187	0.22643	0.2159	4.46	1.29	4.73
863	144	0.22643	0.2165	5.03	2.76	6.95
1123	260	0.22620	0.2155	6.38	2.38	4.92
1483	360	0.22679	0.2094	7.89	1.89	4.42
2400	917	0.22683	0.2052	11.55	1.84	2.60
3120	720	0.22659	0.2003	14.35	1.82	1.14
					Mean	1.79

As indicated in Table IV, the values of K_m are in good agreement while those of K_b show considerable variation. The iodide content, including free iodine present, remained practically constant. For the 14 values of K_m given, the standard deviation (S. D.) is 0.72×10^{-5}, the standard deviation of the mean is 0.19×10^{-5}, the probable error (PE), is 0.48×10^{-5} and the probable error of the mean is 0.13×10^{-5}.

As further verification of the order of reaction, three samples of aqueous solu-

tion of ferrous iodide, prepared from card teeth and Reagent iodine and differing in concentration were stored under the conditions outlined above and the rate of reaction determined. The data are shown in Table V.

TABLE V.—RATE OF REACTION OF AQUEOUS SOLUTIONS OF FERROUS IODIDE PREPARED FROM CARD TEETH AND REAGENT IODINE AND STORED IN THE THERMOSTAT AT 30° C. IN DARKNESS.

Conc. FeI_2 Mols/L.	No. of Det'ns.	Total Hours.	$K_m \times 10^3$ Mean.	S. D. of $K_m \times 10^3$.	$K_b \times 10^3$ Mean.	S. D. of $K_b \times 10^3$.
0.47935	9	3048	3.21	0.27	23.91	11.43
0.22594	17	3007	3.22	0.76	6.86	3.36
0.11770	6	2086	3.88	0.25	63.30	15.21

It was concluded from the data shown in Table V that the first order reaction equation is applicable to this decomposition. The standard deviation of the mean at the concentration of the U. S. P. Syrup being 0.18×10^{-5}, the mean may be stated as $3.22 \pm 0.18 \times 10^{-5}$.

The rate of decomposition for card teeth solutions is greater than for solutions prepared from Reagent iron, nearly twice as much iodine being formed per hour in terms of per cent decomposition per unit time.

The Effect of Type of Glass upon the Rate of Decomposition.—Containers used for determination of the rate of reaction as shown in Tables IV and V, imparted alkalinity to distilled water upon standing. To ascertain the effect of a container imparting no alkalinity to glass, similar determinations were made upon an aqueous solution of ferrous iodide stored under conditions identical with the above, in such a container (Pyrex bottle). Ten analyses were made upon the solution which assayed 0.22693 mols/L. of ferrous iodide. These determinations were made over a period of 1675 hours. The mean value for K_m was 6.96×10^{-5}; the standard deviation was 0.57×10^{-5}; the standard deviation of the mean was 0.18×10^{-5}. Thus K_m may be stated as $6.96 \pm 0.18 \times 10^{-5}$.

It was concluded that the type of glass in the container exerted a marked effect upon the rate of decomposition, alkaline glass exerting a retarding effect.

During the progress of this investigation, alkaline glass was employed in order to obtain results directly applicable to common pharmaceutical containers.

The Effect of Surface Area upon the Rate of Decomposition.—Since decomposition of aqueous solutions of ferrous iodide requires oxygen, it is probable that the rate of reaction would depend directly upon the rate of oxygen absorption, provided auto-oxidation is appreciably more rapid than absorption. This rate of absorption would in turn depend to some extent upon the surface exposed, *i. e.*, the reaction would be of the zero order.

In order to extend the previous determinations of reaction rates to include conditions of minimal practical surface area exposed, an aqueous solution of ferrous iodide was stored under conditions identical with those of previous reaction rate determinations. In this case, however, a container was chosen of such shape that only about $^1/_5$ of the previous surface exposure occurred. This container was typical of common prescription bottles. Ten determinations of the rate of reaction over a period of 2986 hours gave a mean value for K_m of 3.15×10^{-5}. The standard deviation was 0.37×10^{-5} and the standard deviation of the mean was 0.11×10^{-5}. Thus, K_m may be stated as $3.15 \pm 0.11 \times 10^{-5}$.

It was concluded that under ordinary conditions, the absorption of oxygen is more rapid than auto-oxidation and that, therefore, the reaction is not one of the zero order.

The Effect of Limited Availability of Oxygen.—Fifty samples of aqueous solution of ferrous iodide were stored in darkness in the thermostat at 30° C., in completely filled, tightly stoppered bottles. Stoppers were protected from the action of iodine and the containers sealed with paraffin. A sample was removed and assayed for iodine content at intervals over a period of 3122 hours. Variable results, ranging from 1.90×10^{-4} mols/L. to 9.51×10^{-4} mols/L. of free iodine, were found present in 14 determinations. It is significant that low values were impartially distributed over the duration of the experiment.

It was concluded from the distribution and magnitude of the results, that upon expiration of the contained oxygen, little decomposition occurs in aqueous solutions of ferrous iodide stored without access to atmospheric oxygen.

A series of samples of aqueous solution of ferrous iodide was next stored in sealed pycnometers. All water used in the preparation was vigorously boiled before use and allowed to cool in completely filled, tightly stoppered bottles. No precipitate appeared in these samples during 792 hours. The value of K_m was 2.59×10^{-6}. Bubbles of gas appeared at the surface of the liquid in these preparations but did not appear in solutions of ferrous sulphate similarly prepared and stored. It appears probable that a slow secondary decomposition occurs in the absence of oxygen according to the equation:

$$2HI \rightleftharpoons H_2 + I_2$$

The Effect of Viscosity upon the Rate of Decomposition.—As a means of determining the effect of viscosity upon the rate of auto-oxidation of solutions of ferrous iodide, aqueous solutions of the salt were rendered viscous with tragacanth and the rate of reaction evaluated in terms of the specific reaction rate, K_m. Tragacanth was chosen as being a neutral non-reactant carbohydrate. Viscosities were determined by means of viscosimeter tube and stop-watch (15). Preliminary experiments showed that tragacanth in the concentrations used was without effect upon free iodine during the duration of the experiments. Table VI shows the data obtained. Values of a solution without added tragacanth are from Table V.

TABLE VI.—RATE OF DECOMPOSITION OF AQUEOUS SOLUTIONS OF FERROUS IODIDE RENDERED VISCOUS WITH TRAGACANTH AT 30° C.

Conc. of FeI_2 in Mols/L.	Relative Viscosity (30°/30°).	No. of Det'ns.	Time Hours.	$K_m \times 10^5$ Mean.	S. D. $\times 10^5$.	$K_m \times 10^5$.
0.22594	1.072	(See Table V)		3.22	0.25	3.22 ± 0.18
0.22811	2.507	5	1227	1.73	0.10	1.73 ± 0.04
0.22783	6.296	5	1227	1.01	0.01	1.01 ± 0.01
0.21323	19.8	5	1848	1.05	0.07	1.05 ± 0.03
0.21490	539.7	5	1848	0.79	0.02	0.79 ± 0.01

As indicated in Table VI, increases above a relative viscosity of approximately 6 have little effect upon the specific reaction rate. From these data it was concluded that the specific reaction rate is a hyperbolic function of the viscosity or of some factor proportional to viscosity.

The Effect of Variations in Temperature upon the Rate of Decomposition of Aqueous Solutions of Ferrous Iodide.—In order to determine the effect of variations in temperature upon the auto-oxidation rate of aqueous ferrous iodide solutions, samples of various viscosities were stored in the oven at 50° C. ± 2° and in the refrigerator at 6° C. ± 1°. All samples were stored in containers with an excess of air. Reaction rates were determined in the usual manner, viscosities are stated relative to water at 30° C. although determined at the reaction temperature, and tragacanth was used as the substance imparting viscosity. Data in Table VII referring to solutions at 50° C. were determined after short intervals of exposure since the solutions increased greatly in viscosity with time. These results, therefore, are only approximate.

TABLE VII.—THE EFFECT OF VARIATION IN TEMPERATURE UPON THE SPECIFIC REACTION RATE OF AQUEOUS SOLUTIONS OF FERROUS IODIDE OF VARIOUS VISCOSITIES.

Conc. FeI_2 Mols/L.	Relative Viscosity.	Temp. ° C.	Total Hours.	No. of Det'ns.	Mean $K_m \times 10^4$.	S. D. $\times 10^4$.	$K_m \times 10^4$.
0.22690	1.062	50	575	5	3.21	0.27	3.21 ± 0.12
0.22525	1.200	50	68	1	1.25	..	.....
0.22811	2.26	50	336	1	0.60	..	.....
0.22383	5.13	50	336	1	0.59	..	.....
0.21225	26.74	50	1126	5	0.61	0.19	0.61 ± 0.01
0.22690	1.075	6	1012	5	0.38	0.05	0.38 ± 0.02
0.22810	64.32	6	840	3	0.22	0.005	0.22 ± 0.003
0.22380	89.68	6	840	3	0.10	0.04	0.10 ± 0.002
0.21007	525.0	6	1152	3	0.35	0.02	0.35 ± 0.01

It was concluded that solutions of ferrous iodide at 50° C. have a temperature coefficient of approximately 3 for each ten degree rise in temperature. The curve of viscosity against reaction rate is hyperbolic and the greatest variation is between relative viscosities of 1 and 26. At 6° C., however, the reaction is more rapid than at 30° C., and the curve of viscosity against specific reaction rate is nearly linear for relative viscosities below 100.

The Effect of Light upon the Rate of Decomposition of Aqueous Solutions of Ferrous Iodide.—That light catalyzes the auto-oxidation of iodide ion has long been known and Berthoud and Nicolet (16) have shown that all light from the visible spectrum is active. It has not previously been shown, either that the decomposition of ferrous iodide is typical of iodide ion, with respect to the catalytic effect of light, or is sensitive to certain spectrum bands. To evaluate this factor, aqueous solutions of ferrous iodide were stored in containers with excess air, behind a series of light filters in direct sunlight, and a control run with the experiment. No significant difference in specific reaction rate could be found in any sample, although the auto-oxidation proved to be more rapid than in solutions stored in darkness under similar conditions of heat and exposure. It was concluded that the auto-oxidation of ferrous iodide is catalyzed by all rays of the visible spectrum and is thus typical of iodide ion oxidation.

The action of ultraviolet light was evaluated indirectly. The specific reaction rate of solutions stored in sunlight in quartz flasks was compared with that for solutions similarly stored in pyrex. Since results were identical, it is probable that ultraviolet light has no catalytic effect upon this decomposition.

The Appearance of Permanent Dark Coloration in Syrup of Ferrous Iodide.—Obviously, the liberation of free iodine in Syrup of Ferrous Iodide results in dark coloration; this, however, seldom occurs due to the hypophosphorous acid content of the preparation. Nevertheless, the Syrup, upon standing, assumes a very dark brown or black color rendering it unfit for use. Since neither aqueous solutions of ferrous iodide nor aqueous solutions of ferrous iodide containing hypophosphorous acid show this phenomenon, the discoloration must be ascribed to the presence of sucrose or its decomposition products. The change has commonly been misnamed caramelization.

Preliminary experiments showed that either ferrous ion as ferrous sulphate or hypophosphorous acid was capable, the latter much more efficiently than the former, of producing a dark coloration in simple syrup if present in the proportions found in the U. S. P. Syrup of Ferrous Iodide. Phosphoric acid also possesses this property, but free iodine was slowly and completely decolorized.

Samples of Syrup of Ferrous Iodide with the hypophosphorous acid omitted, stored in direct sunlight or in the oven at 50° C. rapidly became black in color and contained a black precipitate. Thus hypophosphorous acid does not cause this change to occur although it may act as a catalyst.

Sucrose, upon inversion, forms equimolecular quantities of dextrose and levulose, and Krantz (17) has shown that inversion is 96.2% complete in Syrup of Ferrous Iodide in 20 days. Accordingly, samples of Syrup of Ferrous Iodide were prepared, substituting in one case 2.484 mols/L. of Merck's C.P. dextrose for the sucrose, and in the other, 2.484 mols/L. of Cenco pure levulose. In one month's exposure in the oven at 50° C., in the presence of air, the sample containing levulose was black; that containing dextrose was yellow, but no darker than a sample of simple syrup containing an equivalent quantity of ferrous sulphate and stored under the same conditions. Similarly, samples of U. S. P. X Syrup of Hydriodic Acid also turn black in color under these conditions. This Syrup contains hypophosphorous acid.

It was concluded that levulose, formed by hydrolysis of the sucrose present in the official Syrup, is the cause of the dark coloration appearing in Syrup of Ferrous Iodide.

The Effect of Various Preservatives upon Free Iodine.—The action of any preservative or stabilizer in Syrup of Ferrous Iodide may be twofold: it may decrease the rate of auto-oxidation and it may cause the disappearance of free iodine. Adding the stipulation that it must not cause side reactions to occur, gives three criteria for the evaluation of preservatives from a chemical standpoint. Thus a substance may act as a stabilizer under one of these criteria, yet be rejected on the basis of another. Sucrose is typical of this class.

In order to evaluate various stabilizers on the basis of their action on free iodine, solutions containing approximately 0.01 mols/L. of free iodine as Compound Solution of Iodine, U. S. P. X, and 2.484 mols/L. of the preservative were stored in darkness with excess air in the thermostat at 30° C. Free iodine was determined at intervals. A control showed no loss of iodine during the duration of the experiment. The value 2.484 mols/L. was used to give results directly comparable with sucrose, this figure representing the sucrose content of Syrup of Ferrous Iodide.

Merck's Lactose, Merck's C.P. dextrose, Merck's U. S. P. citric acid, Merck's

U. S. P. tartaric acid, Colgate's C.P. glycerin, U. S. P. sucrose, U. S. P. alcohol and U. S. P. honey were tested in this manner. Only 170 Gm./L. of lactose were used due to its low solubility and honey was weighed as dextrose. It was found that sucrose, dextrose, lactose, honey, and to a lesser degree, citric acid, exert a slow chemical action upon free iodine in the presence of iodide ion in aqueous solution.

To determine the effect of ferrous ion upon this reaction, solutions were prepared containing approximately 0.236 mol/L. of ferrous iodide, 2.484 mols/L. of either honey, sucrose or dextrose and approximately 0.01 mol/L. of free iodine. They were stored either at 30° C. or at 50° C. and free iodine frequently determined. The quantity of iodine reacting with the preservative is the difference between that originally present and the quantity present at the time of analysis plus free iodine formed at that temperature and viscosity by decomposition. The latter values were obtained from the equation:

$$K_m = 2.303/t \log a/a - x$$

where x is the quantity of iodine formed in time t from a solution of original concentration a. Values of K_m were obtained from Tables VI and VII by interpolation to the proper viscosities.

It was found that heat accelerated the carbohydrate reaction to a greater degree than the auto-oxidation since samples at 50° C. rapidly became free from iodine. Samples at 30° C. were decolorized slowly in the case of sucrose and more rapidly in the case of honey; although honey was more efficient in this respect at 30° C., sucrose was more rapid than honey at 50° C. The action of dextrose was not so rapid, but at room temperature, about 22° C., none of these sugars reduced iodine as rapidly as it was formed. Apparently, the ferrous ion present exerted a catalytic effect since reduction of iodine was more rapid than in simple aqueous solution. The presence of some relatively rapid reducing agent in honey is indicated by the rate of reaction which is much greater than with sugars alone.

TABLE VIII.—THE EFFECT OF PRESERVATIVES UPON AQUEOUS SOLUTIONS OF FERROUS IODIDE AT 30° C. STORED IN EXCESS AIR IN DARKNESS.

Preservative.	Hours.	No. of Det'ns.	$K_m \times 10^5$ Mean.	S. D. $\times 10^5$.	$K_m \times 10^5$.	Rate of Decomp. $\times 10^5$.
Sucrose (Card teeth)	3003	6	..	..	.....	0.85
Sucrose (Reag. iron)	2824	5	..	..	.....	0.85
Honey-calc. as dextrose	2520	4	..	..	.....	1.56
Dextrose	2956	5	0.53	0.23	0.53 ± 0.10	1.05
Lactose 170 Gm./L.	2525	4	1.77	0.61	1.77 ± 0.30	2.5
Glycerin	2478	4	1.25	0.64	1.25 ± 0.32	2.1
Citric acid	2775	5	1.75	0.36	1.75 ± 0.16	1.5
Tartaric acid	2394	5	2.71	0.95	2.71 ± 0.44	1.65
Alcohol	2374	4	1.95	0.43	1.95 ± 0.19	2.07

The Chemical Evaluation of Preservatives.—To verify conclusions reached above, samples of aqueous solutions of ferrous iodide containing 2.484 mols/L. of preservative were placed in the thermostat at 30° C. in darkness with an excess of air in the container. Iodine was determined at frequent intervals. The data are summarized in Table VIII. The quality of chemicals has been noted above. Column 7 shows the rate of decomposition to be expected from viscosity readings performed upon these solutions. These data are interpolated from Table VI.

As indicated in Table VIII, true preservative effect beyond the effect of the viscosity imparted to the solution is shown by sucrose, honey, dextrose, lactose and glycerin. Alcohol is apparently without effect and citric and tartaric acids increase the rate of decomposition. This is probably due to the increased hydrogen-ion concentration of these acid solutions; the p_H was 0.4.

The Pharmaceutical Evaluation of Preservatives.—Solutions of ferrous iodide, approximately 5% except as noted, were prepared, except as noted, from card teeth and U. S. P. iodine and contained the following: honey, 500 cc./L.; honey, 250 cc./L.; sucrose, 425 Gm./L. and honey, 425 cc./L.; sucrose, 800 Gm./L. and honey, 50 cc./L.; 10% FeI_2 and 800 Gm./L. of dextrose; sucrose, 850 Gm./L. and H_3PO_2, 5 cc./L.; sucrose, 850 Gm./L. and $Na_2S_2O_3$, 1 Gm./L.; 10% FeI_2 and sucrose, 850 Gm./L.; sucrose, 850 Gm./L. and NaOH, 0.1975, 0.2949 and 0.6908 Gm./L. in separate samples; sucrose, 850 Gm./L., prepared with Reagent iron; sucrose, 850 Gm./L. and hydroquinone, 5 Gm./L.; glycerin, 800 cc./L.; sucrose, 850 Gm./L. and H_3PO_2, 5 cc./L. (control); and sucrose, 850 Gm./L. with H_3PO_2, 5 cc./L., prepared from Reagent iron. Samples of these solutions were stored both in half-filled and in completely filled, tightly stoppered bottles in diffused light and in darkness at room temperature, in direct sunlight and in the refrigerator at about 6° C.

At the end of 3 months, those samples stored in direct sunlight in the presence of air were black in color with the exception of those containing dextrose or glycerin; the dextrose sample alone contained free iodine. Free iodine was contained in all samples stored in the refrigerator except those containing H_3PO_2 which had, however, darkened somewhat.

In general, after 9 months' exposure, the following observations were made: storage in completely filled bottles is desirable; sunlight hastens the appearance of black coloration although the increased temperature accelerates the reduction of iodine to a greater degree than the auto-oxidation of iodide; the addition of NaOH decreases the rate of iodine formation but is undesirable due to the coloration produced in the freshly made solution; Reagent iron samples show less free iodine than those prepared from card teeth; honey alone is valueless as a preservative; glycerin is ideal in sunlight but valueless in darkness or diffused light; $Na_2S_2O_3$ gives a cloudy preparation by liberation of free sulphur; hydroquinone is a valuable anti-oxidant except at low temperatures; and free iodine added to blackened preparations of ferrous iodide containing sucrose or honey, rapidly disappears.

It was concluded that none of the combinations used was entirely satisfactory as offering a stable preparation.

The Stabilization of Syrup of Ferrous Iodide.—It has been shown that sucrose is incompatible with aqueous solutions of ferrous iodide. It has likewise been shown that dextrose is compatible with both ferrous iodide and hypophosphorous acid. Thus, it would appear that the ideal preparation would contain dextrose to give the properties of a syrup and hypophosphorous acid to prevent the liberation of iodine.

Solutions of ferrous iodide containing the official quantity of H_3PO_2 and either 700 Gm./L. of C.P. dextrose, commercial dextrose[1] or 400 Gm./L. of U. S. P. Glu-

[1] A brand of dextrose, "Penford Crystal Sugar," made by Penick and Ford, Cedar Rapids, Iowa, was employed.

cose were subjected to a temperature of 50° C. for 3 months both in half-filled and in completely filled, tightly stoppered bottles. A U. S. P. control was run in conjunction. The freshly prepared solutions varied in color with the purity of the dextrose used; C.P. dextrose gave a perfectly colorless preparation but that from U. S. P. Glucose was definitely yellow.

At the end of one month, the control was black but all other samples remained unchanged. In 4 months, the syrups containing dextrose were pale yellow and contained a slight sediment; the change was more pronounced in samples stored in the presence of air and varied in direct proportion to the purity of the dextrose. Samples containing Glucose, U. S. P. X, had become very dark.

One month's exposure in the oven at 50° C. is roughly equivalent to 1 year under ordinary conditions, hence it may be assumed that dextrose samples would be acceptable for 4 years at ordinary temperatures.

It was concluded that Syrup of Ferrous Iodide may be stabilized by substituting 700 Gm. of dextrose for the sucrose contained in the official formula, either C.P. dextrose or the commercial grade being satisfactory. The resulting preparation is very palatable. The syrup so prepared is best kept at room temperature as some of the dextrose may crystallize at low temperatures.

DISCUSSION OF RESULTS.

It can be shown by solubility product data and p_H values that precipitation of ferric hydroxide cannot occur in Syrup of Ferrous Iodide. On the other hand, similar calculations in conjunction with the quantity of air present, indicate that precipitation occurs in the reaction mixture of preparations at secondary equilibrium before dilution, but does not take place until after dilution in preparations from Reagent iron at primary equilibrium.

It has been shown that no stoichiometric expression is applicable to the decomposition of aqueous ferrous iodide solutions. On the other hand, hydrolysis has been shown to occur predominantly as:

$$\text{(I)} \qquad FeI_2 + HOH \rightleftharpoons Fe(OH)I + HI$$

and therefore, the solution contains iodide and ferrous ions in the presence of hydrogen ions. Iodide ion is oxidizable by oxygen according to the equation:

$$\text{(II)} \qquad 2I^- + {}^1/_2O_2 + 2H^+ \rightleftharpoons I_2 + HOH$$

Secondary hydrolysis of the basic ferrous iodide formed as shown in equation (I) furnishes small quantities of ferrous hydroxide:

$$\text{(III)} \qquad Fe(OH)I + HOH \rightleftharpoons Fe(OH)_2 + HI$$

which may then be oxidized,

$$\text{(IV)} \qquad Fe(OH)_2 + {}^1/_2O_2 + HOH \rightleftharpoons Fe(OH)_3$$

This reaction may occur even in faintly acid media. Thus the relative amounts of ferric hydroxide and iodine formed will depend entirely upon the relative ease of oxidation of ferrous hydroxide and iodide ion. The normal oxidation potentials being:

$$(Fe^{+++}, Fe^{++})Pt = .743$$
$$({}^1/_2I_2, I^-)Pt = .538$$
$$(O_2, OH^-) = .396$$

it is evident that when both are present in the reduced form, ferrous iron will be oxidized more readily than iodide ion. This is in accord with the experimental results.

The oxidation of iodide ion in this preparation has been shown to be a first order reaction and dependent in rate upon the purity of the iron, the temperature, the action of light, access to air and viscosity or of some factor proportional to viscosity. Its dependence also upon the hydrogen-ion concentration has been shown by Husa and Magid (18). Consequently, aside from slight increases in viscosity, changes in the ferrous iodide content of the preparation can have no effect upon the rate of iodine formation and increases in concentration of ferrous iodide will increase the quantity of iodine formed.

It would appear, from data on preservatives, that levulose is a very efficient reducing agent for iodine in faintly acid media. The action of honey is very rapid as regards the reduction of iodine, dextrose is much slower than sucrose and free iodine added to blackened ferrous iodide syrups is rapidly reduced; all these factors point to the action of levulose in this respect. Thus it appears highly probable that the true decomposition of Syrup of Ferrous Iodide is the darkening caused by the oxidation of levulose by iodine or oxygen. Darkening due to free iodine is not a factor in this decomposition since the appearance of free iodine is effectively prevented by hypophosphorous acid.

The reducing action of glycerin in sunlight may be due to the formation of glyceric aldehyde which in turn is oxidized. This aldehyde is formed only in light (19).

Obviously, Syrup of Ferrous Iodide may be stabilized by omitting sucrose from the formula. Dextrose serves to give the characteristic properties of a syrup to the preparation and by its use the darkening is avoided.

SUMMARY.

A study has been made of the preparation, deterioration and stabilization of Syrup of Ferrous Iodide. Impurities present in card teeth were found to cause variations in the progress of the reaction.

Equations previously advanced to represent the decomposition of ferrous iodide preparations are shown to be unsatisfactory. The present study indicates that the deterioration involves several different changes which occur simultaneously, but at different rates according to the conditions.

The darkening of Syrup of Ferrous Iodide, U. S. P. X, has been shown to be due chiefly to decomposition of levulose formed by hydrolysis of sucrose. This darkening can be avoided by using dextrose in place of sucrose.

The most practical means for the preservation of Syrup of Ferrous Iodide is the use of hypophosphorous acid to prevent the liberation of free iodine and the addition of dextrose rather than sucrose to give the properties of a syrup. The use of 700 Gm./L. of either C.P. or commercial dextrose yields a satisfactory product.

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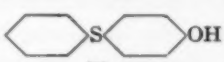
THE PREPARATION AND BACTERIOLOGICAL STUDY OF CERTAIN THIAZOLE AZO DYES.*

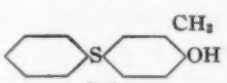
BY W. A. LOTT AND W. G. CHRISTIANSEN.

In view of the recent demonstrations of the germicidal activity of divalent sulphur compounds such as *p*-hydroxy diphenyl sulphide, I,

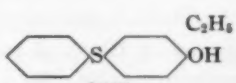


(I)

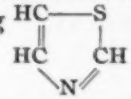
prepared by Hilbert and Johnson (1), and 3-methyl 4-hydroxy diphenyl sulphide, II, and 3-ethyl 4-hydroxy diphenyl sulphide, III,



(II)



(III)

prepared by E. Moness, W. Braker and W. G. Christiansen (2), it seemed possible that divalent ring sulphur, as it appears in, for example, the thiazole heterocyclic ring  might also carry bactericidal activity. The most readily available

starting material of this type was the easily synthesized amino thiazole, IV,

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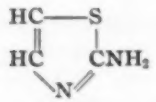
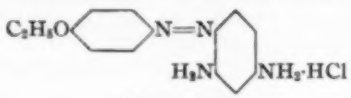
* Scientific Section, A. PH. A., Madison meeting, 1933.



(IV)

Inasmuch as some azo dyes such as 4-ethoxy 2′,4′-diamino azobenzene monohydrochloride, V (Serenium), are bactericidal, it was thought that



(V)

compounds containing both the ring divalent sulphur and the azo groupings might be useful bactericides. Some compounds of this type have been prepared by diazotizing amino thiazole and coupling with phenolic substances.

PREPARATION OF AMINO THIAZOLE.

The amino thiazole was prepared by the method of V. Trauman (3) in which 53 Gm. of thiourea in 250 cc. water was condensed with 100 Gm. α,β-dichlorethyl ether. After the two liquid layers merged, refluxing was continued 10 minutes, after which the reaction mixture was evaporated until the characteristic odor of the α,β-dichlorethyl ether had disappeared. After making the solution strongly alkaline it was extracted repeatedly with ether.

The combined residue from these ether extracts was recrystallized out of alcohol, and a yield of 30 Gm. of red crystalline amino thiazole of melting point 88.5° to 90.5° C. was obtained.

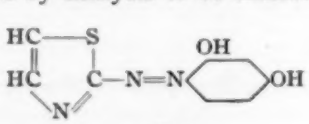
Analysis: Found—S, 31.94%. Calculated for $C_3H_4N_2S$: S, 32.00%.

PREPARATION OF THIAZOLE AZO RESORCINOL.

The diazotization of amino thiazole was very slow and incomplete by the usual method, but when all of the sodium nitrite is added at one time to the acidified solution of the amino thiazole, thereby obtaining a high concentration of nitrous acid, an acceptable yield of the diazonium salt is obtained.

5 Gm. of amino thiazole (0.5 mol.) was dissolved in 13 cc. of hydrochloric acid (1.5 mol.) and 125 cc. water. This was diazotized at 0–5° C. by adding 3.5 Gm. of $NaNO_2$ as fast as possible without allowing the temperature to rise above 5° C., using efficient agitation and an external cooling bath of ice and salt. Thereupon, 5.5 Gm. resorcinol in 10 cc. of cold water was added. The precipitated azo dye was agitated without cooling for an hour in order to induce its change from a gelatinous material to a granular one.

4.5 Gm. of crude material having a low sulphur content was obtained. Repeated reprecipitation out of alkaline solution by dilute HCl gave about 1.5 Gm. of material which was shown by analysis to be thiazole azo resorcinol, VI,



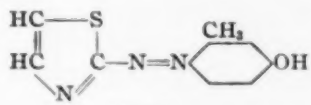
(VI)

Analysis: Found—S, 14.99%. Calculated for $C_9H_7O_2N_3S$: S, 14.47%.

Bacteriological test showed that although this substance (when dissolved in aqueous alkali) had no germicidal activity, it inhibited growth of both Typhoid and Staphylococcus at a dilution of 1 to 8000.

PREPARATION OF THIAZOLE AZO-*m*-CRESOL.

5 Gm. of amino thiazole was dissolved in 100 cc. 20% H_2SO_4 and diazotized at 0–5° C. with 3.5 Gm. $NaNO_2$, the latter being added as in the above preparation. When the excess of HNO_2 was very low, as indicated by starch iodide papers, 5.4 Gm. meta-cresol in 10 cc. water at 0° C. and enough 10% NaOH to keep it in solution were added. After agitating two hours at room temperature, the precipitated dye became granular. This was filtered and reprecipitated several times out of alkaline solution by dilute HCl. A yield of 5.8 Gm. of thiazole azo *m*-cresol, VII, was obtained.

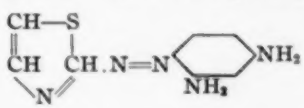


(VII)

Analysis: Found—S, 13.33%. Calculated for $C_{10}H_7ON_3S$: S, 14.60%.

Although this material showed no germicidal action it inhibited the growth of Typhoid and Staphylococcus at dilutions up to 1 to 16,000. The dye was dissolved in water with a minimum quantity of sodium hydroxide for germicidal test.

By coupling diazotized amino thiazole with metaphenylene diamine a dye was obtained which probably had the following structure:



This product was not obtained in a sufficiently pure form to warrant biological tests.

The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb & Sons and we gratefully acknowledge their assistance.

SUMMARY.

Thiazole azo resorcinol and thiazole azo *m*-cresol were prepared by the diazotization of amino thiazole with subsequent coupling of the diazonium salt with the respective phenols. Although solutions of these two azo dyes failed to kill, they restrained the growth of Typhoid and Staphylococcus in dilutions of 1 to 8000 and 1 to 16,000, respectively.

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A STUDY OF THE ACRYLIC AMIDES AND UREIDES AS HYPNOTICS.*

BY W. A. LOTT AND W. G. CHRISTIANSEN.

It has long been known that the amides and ureides of acids of fairly high molecular weight are more or less hypnotic. The variation in the hypnotic potency is very great and, in the unhalogenated acids, this potency seems to depend upon (1) the molecular weight, (2) the degree of branching of chain (ramification) and (3) the presence or absence of unsaturation.

For those acids which can be viewed as derivatives of acetic acid, the correlation between the above factors and the potency has been rather well worked out. For the derivatives of acrylic acid, $CH_2 = CH - COOH$, this correlation has, however, not previously been worked out. It will be seen that acrylic acid and its derivatives are not derivatives of acetic acid, since there cannot be three separate substituents attached to the alpha carbon.

It was the purpose of the work reported in this paper to evaluate as hypnotics the amides and the ureides of several major types of substituted acrylic acids; and in so far as it is possible over the limited field covered, to set up correlations between physiological activity and molecular weight, type of substituents and configuration.

The acids from which these compounds are derived fall into three major classes from the standpoint of structure, *viz.:*

(1) Aliphatic substituted acrylic acids.
(2) Substituted cinnamic acids.
(3) Furane substituted acrylic acid.

No new synthetic methods have been devised.

ACIDS.

The acids have been prepared by one of five well-known methods:

(A) Oxidation of corresponding aldehyde (1)–(2) by means of silver oxide.

(*a*) α-Ethyl-β-propyl acrylic acid.
(*b*) α-Amyl cinnamic acid.

(B) Condensation of an aldehyde with malonic acid in presence of pyridine (3).

(*a*) Furfuracrylic acid.
(*b*) β-Propyl acrylic acid.
(*c*) β-Propenyl acrylic acid (sorbic acid).

(C) Perkin Synthesis. Condensation of benzaldehyde with the sodium salt of an acid which has no substituents in the alpha position, in the presence of acetic anhydride (4).

(*a*) α-Propyl cinnamic acid.

(D) Claisen Synthesis. Condensation of benzaldehyde with an ester of an acid which has no substituents in the alpha position, by means of sodium.

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* Scientific Section, A. PH. A., Madison meeting, 1933.

(*a*) α-Methyl cinnamic acid.
(*b*) α-Ethyl cinnamic acid.
(*c*) α-Isopropyl cinnamic acid.
(*d*) α-Ethyl *p*-methoxy cinnamic acid.
(*e*) α-Ethyl *o*-chlor cinnamic acid.

(E) Reformatsky Synthesis. Condensation of acetophenone (or a homologue) with bromacetic ester by means of zinc (6).

(*a*) β-Methyl cinnamic acid.

ACID CHLORIDES.

The acid chlorides were all readily prepared by heating the acids with a 100% excess of thionyl chloride under a reflux condenser. When the reaction was complete the excess thionyl chloride was removed in vacuum at room temperature. In most cases the acid chloride was then distilled in vacuum. This was not necessary but facilitated the purification of the end products.

AMIDES.

The amides were prepared by the dropwise addition of the acid chloride to a 28% aqueous solution of ammonia, with mechanical agitation and external cooling. The crude amide separated, usually as a discolored solid mass. The ring-substituted cinnamides tended toward greater discoloration. It was found that recrystallization from anhydrous methyl alcohol was the best means of purification, being facilitated sometimes by treatment with decolorizing carbon. Yields in most cases were not good. Earlier in the work, dilute ethyl alcohol and sometimes 95% alcohol were used as the crystallizing solvent.

The following amides were prepared.

(1) Furfuracrylic amide, melting point—168–169° C.
Previously recorded melting point—168–169° C.

(2) α-Ethyl-β-propyl acrylic amide, melting point—66–67° C.
% N—9.22; calculated for $C_6H_{11}ON$, 9.88.

(3) α-Methyl cinnamic amide, melting point—125.5–126° C.
Previously recorded melting point—128° C.
% N—8.96; calculated for $C_{10}H_{11}ON$, 8.70.

(4) α-Ethyl cinnamic amide, melting point—135–137° C.
Previously recorded melting point—128° C.
% N—7.84; calculated for $C_{11}H_{13}ON$, 8.00.

(5) α-Isopropyl cinnamic amide, high melting isomer. This isomer was obtained by crystallization from dilute alcohol.
Melting point—127–129° C.
% N—7.98; calculated for $C_{12}H_{15}ON$, 7.40.

(6) α-Isopropyl cinnamic amide, low melting isomer. This isomer was obtained by repeated recrystallization from ethyl alcohol.
Melting point—111–111.5° C.
% N—7.48%; calculated for $C_{12}H_{15}ON$, 7.40.

(7) α-Amyl cinnamic amide, high melting isomer. This isomer was obtained by recrystallization, first from dilute alcohol, and finally out of hot water.
Melting point—124–124.5° C.
% N—5.88; calculated for $C_{14}H_{19}ON$, 6.45.

(8) α-Amyl cinnamic amide, low melting isomer. This isomer was obtained by recrystallizing the high melting isomer several times from 95% alcohol.
Melting point—117° C.
% N—6.47; calculated for $C_{14}H_{19}ON$, 6.45.

(9) α-Ethyl *p*-methoxy cinnamic amide.
Melting point—170–170.5° C.
% N—6.95; calculated for $C_{12}H_{15}O_2N$, 6.83.

(10) α-Ethyl *o*-chlor cinnamic amide.
Melting point—93–94° C.
% N—7.16; calculated for $C_{11}H_{12}ONCl$, 6.70.
% Cl—16.50; calculated for $C_{11}H_{12}ONCl$, 16.95.

(11) α-Ethyl cinnamic N-ethyl amide.
Melting point—99.5–100° C.
% N—6.81; calculated for $C_{13}H_{17}ON$, 6.88.

(12) β-Methyl cinnamic amide.
Melting point—115–116° C.
Previously recorded melting point—115–116° C.
% N—9.27; calculated for $C_{10}H_{11}ON$, 8.70%.

UREIDES.

The ureides were in all cases prepared by triturating the acid chloride with three equivalents of dry urea in a mortar, then warming in an oven at 70° C. for 3 hours. Purification was effected by leaching with cold water in order to remove urea, then with dilute sodium bicarbonate solution in order to remove any free acid or unreacted acid chloride. The ureide was recyrstallized repeatedly from dilute alcohol.

The following ureides were prepared.

(1) Furfuracrylic ureide.
Melting point—204–206° C.
% N—15.43; calculated for $C_8H_8O_2N_2$, 15.55.

(2) *n*-Propyl acrylic ureide.
Melting point—181–183° C.
% N—18.11; calculated for $C_7H_{12}O_2N_2$, 17.94.

(3) β-Propenyl acrylic ureide (sorbic ureide).
Melting point—226–228° C.
% N—18.10%; calculated for $C_7H_{10}O_2N_2$, 18.19%.

(4) α-Methyl cinnamic ureide.
Melting point—160–162° C.
% N—14.55; calculated for $C_{11}H_{12}O_2N_2$, 13.72.

(5) α-Ethyl cinnamic ureide.
Melting point—189–190.5° C.
% N—13.70; calculated for $C_{12}H_{14}O_2N_2$, 12.84.

(6) α-Propyl cinnamic ureide.
Melting point—184–186.5° C.
% N—12.41; calculated for $C_{13}H_{16}O_2N_2$, 12.07.

(7) α-Isopropyl cinnamic ureide.
Melting point—190–191° C.
% N—12.55; calculated for $C_{13}H_{16}O_2N_2$, 12.07.

(8) α-Amyl cinnamic ureide.
Melting point—158–159° C.
% N—11.13; calculated for $C_{15}H_{20}O_2N_2$, 10.77.

BIOLOGICAL TESTS, ALBINO RATS.

Minimum sleep inducing doses (M. E. D.), and minimum lethal doses of the several amides were first determined on albino rats. In the cases where the drugs are inactive in very high doses, no attempt was made to determine these values within narrow limits, whereas in the cases of those drugs which were fairly active sufficient data were obtained to gain closer estimates of the true M. E. D. and M. L. D.

Amides (albino rats).

Drug.	M. E. D. Mg./Kilo.	M. L. D. Mg./Kilo.
α-Ethyl-β-propyl acrylic amide	275	525
α-Methyl cinnamic amide	ca. 625	>1500
α-Ethyl cinnamic amide	350	> 400
α-Isopropyl cinnamic amide (high melting)	750–1500	= or >1500
α-Isopropyl cinnamic amide (low melting)	ca. 700	ca. 1350
α-Amyl cinnamic amide (high melting)	>2000	>2000
α-Amyl cinnamic amide (low melting)	>2000	>2000
β-Methyl cinnamic amide	300	> 900
α-Ethyl *o*-chlor cinnamic amide	500–800	1000–1200
α-Ethyl *p*-methoxy cinnamic amide	>3000	>3000
α-Ethyl cinnamic N-ethyl amide	ca. 1750	1750
Furfuracrylic amide	100	< 100
α-Bromo diethyl acetic ureide (Adalin)	350	525
Allyl isopropyl acetic ureide (Sedormide)	350	> 400

Ureides (albino rats).

Drug.	M. E. D. Mg./Kilo.	M. L. D. Mg./Kilo.
β-Propenyl acrylic ureide (sorbic)	>2000	>2000
β-Propyl acrylic ureide	>2000	>2000
α-Ethyl-β-propyl acrylic ureide	>2000	>2000
α-Methyl cinnamic ureide	>2000	>2000
α-Ethyl cinnamic ureide	>2000	>2000
α-Propyl cinnamic ureide	>2000	>2000
α-Isopropyl cinnamic ureide	>2000	>2000
α-Amyl cinnamic ureide	>2000	>2000
Furfuracrylic ureide	ca. 500–600	ca. 500–600
α-Bromodiethyl acetic ureide (Adalin)	350	350
Allyl isopropyl acetic ureide (Sedormide)	350	400

AMIDES AND UREIDES (DOGS).

In the cases of those drugs which were active against rats, further tests were

Drug.	M. E. D. Mg./Kilo.	M. L. D. Mg./Kilo.
α-Bromodiethyl acetic ureide (Adalin)	ca. 75	
Allyl isopropyl acetic ureide (Sedormide)	ca. 40	
α-Ethyl cinnamic amide	>250	>250
α-Ethyl *o*-chlor cinnamic amide	>450	
β-Methyl cinnamic amide	>150	
α-Ethyl-β-propyl acrylic amide	Due to vomiting of all higher doses, results were vitiated.	
Furfuracrylic amide	ca. 25	25 (after 48 hours)

carried out with dogs. Wherever there was no hypnotic activity at 250 mg./Kilo. no attempts were made to obtain a narrower evaluation except in one instance.

All dogs died after three days. Autopsy showed hemorrhagic condition of intestines and moderate congestion of stomach.

Furfuracrylic ureide	>175	<75

Autopsy showed hemorrhagic condition of intestines and congestion of lungs.

NOTE: Retest of both furfuracrylic derivatives on rats were carried out. Rats were in good condition after five days. Autopsies disclosed no intestinal irritation or congestion.

DISCUSSION OF BIOLOGICAL RESULTS.

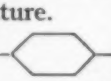
It is to be seen from the biological tests of the amides with rats that (1) the entirely aliphatic α-ethyl-β-propyl acrylic amide is the most active, (2) that in the alpha-alkyl cinnamic amides the activity reaches its peak in the α-ethyl cinnamic amide, and (3) that the β-methyl cinnamic amide is much more active than the α-methyl cinnamic amide. Increasing the molecular weight above that of α-ethyl cinnamic amide seems *per se* to decrease the potency. When this increase of M. W. is due to substituents in which there is inherent tendency toward hypnotic action there is some compensatory action and the decline in potency is less drastic; *i. e.*, α-isopropyl cinnamic amide, and α-ethyl *o*-chlor cinnamic amide. When the increase in molecular weight is through non-hypnotic substituents as in α-ethyl *p*-methoxy cinnamic amide, or is above a certain limit as in α-amyl cinnamic amide this compensatory action is lacking and the hypnotic action is practically obliterated.

The furane ring seems to be very toxic and since there is no sleep produced below the lethal doses with any of its derivatives, it seems to carry no characteristic hypnotic activity. This has also been shown in the case of furoic amide (unreported).

It is to be seen from the biological tests of the ureides with rats that in no case has any characteristic hypnotic action been demonstrated. In the case of the furfuracrylic ureide the sleep produced cannot be ascribed to any characteristic hypnotic action of the drug since it occurred only at lethal doses.

The interpretation of these results is difficult since the resorption and fate of the molecules in the organism have not been studied. Some assumptions are, however, suggested. It seems, for instance, that the ureides are hydrolyzed completely in the intestines of the rat, whereas probably the amides are hydrolyzed much less rapidly. The precipitate drop in activity when the molecular weight is increased beyond that of α-ethyl cinnamic amide and α-isopropyl cinnamic amide suggests that resorption fails due to low solubility.

In the tests with dogs there seems to be evidence that the amides are much more rapidly hydrolyzed in the intestine of the dog than in the intestine of the rat. Other instances of the more rapid destruction of amides and ureides in the higher animals are recorded in the literature.

Structurally, the grouping  seems to contribute little hypnotic activity and deprives the molecule too greatly of its water solubility.

The results with α-ethyl cinnamic N-ethyl amide support the belief that low resorbability is an important factor throughout the series. In this compound it would be expected that both the hypnotic potency and the toxicity should be increased and that the therapeutic ratio potency/toxicity should be decreased. The facts are (1) that the therapeutic ratio decreased greatly so that the hypnotic dose equalled the lethal dose; and (2) that the absolute values of both the potency and toxicity decreased. These facts seem explainable only if it be assumed that only a small part of the dose was resorbed.

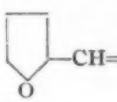
The biological tests on compounds reported herein were made in the Biological Research Laboratories of E. R. Squibb and Sons and we gratefully acknowledge their assistance.

SUMMARY.

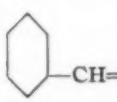
1. An extensive series of ureides and amides derived from the substituted acrylic acids were prepared. A large number of these acids were substituted β-phenyl acrylic or cinnamic acids. One example of a β-heterocyclic acrylic acid, *viz.*, furfuracrylic acid, was included.

2. The biological results with rats seem to indicate that the whole series of compounds were characterized by low resorbability and that the ureide series were further characterized by rapid intestinal hydrolysis. This rapid intestinal hydrolysis seems to be shared by the amide series in the intestine of higher animals (dog). The net hypnotic action and toxicities were, therefore, quite low.

3. The furane ring is considerably more toxic than the benzene ring, and contributes no characteristic hypnotic action, so that in practical terms—



is non-hypnotic and toxic, whereas—



is hypnotic and non-toxic.

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(2) Bogert and Davidson, *J. A. C. S.*, 53 (1931), 3122.
(3) "Organic Syntheses," Vol. 9, page 38, J. Wiley, New York.
(4) Nieuwland and Daly, *J. A. C. S.*, 53 (1931), 1842.

RESEARCH DEPARTMENT OF THE CHEMICAL AND PHARMACEUTICAL LABORATORIES,
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THE WATER OF CRYSTALLIZATION OF QUININE SULPHATE.*

BY H. WALES.[1]

Quinine sulphate crystallized from water has been variously reported as containing 7 and 8 molecules of water. It has also been reported that when exposed

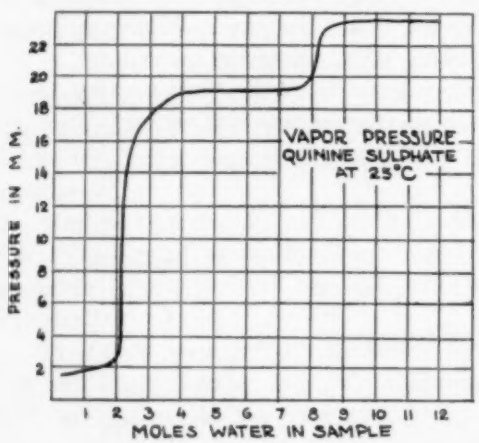
* Scientific Section, A. PH. A., Washington meeting, 1934.

[1] Drug Control, Food and Drug Administration.

to the air it loses water until the dihydrate is formed. (Hesse, *Annalen*, 166 (1873), 217; 176 (1875), 213; Beal and Szalkowski, JOUR. A. PH. A., 22 (1933), 1219.) In all of the experiments reported, the water content has been determined by drying the quinine sulphate in an oven to constant weight. Such tests while showing the amount of water which the quinine sulphate contains do not show how much, if any, exists as water of crystallization, and how much is simply absorbed or dissolved in the quinine sulphate.

It is well known that any water-soluble substance when exposed to the air takes up or loses water until the vapor pressure of the solid solution is equivalent to the pressure of the water vapor in the atmosphere. One method of determining the manner in which the water in a product is held is to measure the change in vapor pressure as small increments of water are removed at a constant temperature.

Theoretically, if water is progressively removed from a hydrate the vapor pressure at a constant temperature remains constant as long as any of that hydrate remains. At this point the pressure drops to that of a lower hydrate, if one is present, or to that of the anhydrous substance. In practice, however, these breaks are not always sharp. Beutell and Blaschke (*Centr. Mineral. Geol.*, 1915, 199) found that in all cases where there is more than one hydrate, the dehydration on the surface of the particles proceeds further than in the interior "where cohesion hinders the evolution of water vapor." The inside of the particles, therefore, may consist of hydrates higher than those at the surface. This prevents a sharp transition from one hydrate to the next and causes the break to become rounded in the plotted curve. This rounding becomes more pronounced the greater the pressure difference between two hydrates.



On the other hand when dealing with a compound in which the water is not present as a hydrate the pressure drops as the water is removed. The curve showing the relation of vapor pressure to water content will not have the breaks characteristic of the hydrate curves, but will be perfectly smooth, its slope being determined by the tenacity with which the water is held.

METHOD.

Quinine sulphate was recrystallized from water and a weighed quantity of the wet crystals used for the determination. Wet quinine sulphate was used in order to avoid any partial desiccation of the highest hydrate. The apparatus used was that described by Wales and Nelson (*J. Am. Chem. Soc.*, 45 (1923), 1657). The product to be tested was placed in a glass bulb sealed to a manometer. A tube containing phosphoric anhydride was placed between this apparatus and the vacuum pump. The system was evacuated for a few seconds, the stop-cock between the drying tube and the manometer system closed and the pressure permitted to come to equilibrium before readings were taken. By this method the vapor pressure was determined to ± 0.5 mm. By weighing the phosphoric anhydride tube after each evacuation the amount of water removed was deter-

mined. The total quantity of water in the quinine sulphate was determined from the total gain in weight of the tube containing phosphoric anhydride. In order to insure complete dehydration the last traces of water were removed by long evacuation at 100° C.

The accompanying table and chart show the results obtained at 25° C. using this method. The highest portion of the curve is approximately the vapor pressure of water at 25° C. and represents the excess moisture since a wet sample was used. The breaks in the curve correspond to 8 and 2 moles of water showing the existence of an octohydrate having a vapor pressure of 19.3 mm. at 25° C. and a dihydrate having a vapor pressure of approximately 2 mm. at the same temperature. No evidence of a heptahydrate is shown. Due to the fact that the apparatus used was not capable of determining pressures below 2 mm. with any degree of accuracy the possibility of a third hydrate having less than two molecules of water of crystallization has not been precluded.

VAPOR PRESSURE AT 25° C. OF QUININE SULPHATE CONTAINING VARYING AMOUNTS OF WATER.

Water in Sample, Per Cent.	Moles Water in Sample.	Pressure, Mm.	Water in Sample, Per Cent.	Moles Water in Sample.	Pressure, Mm.
19.36	10.31	23.5	9.78	4.49	19.0
19.18	9.83	23.5	8.02	3.93	19.0
18.36	9.32	23.2	7.69	3.45	18.4
17.71	8.92	23.0	7.13	3.18	18.0
16.86	8.40	23.0	6.49	2.88	17.0
16.22	8.02	20.0	5.87	2.58	16.5
15.33	7.50	19.8	5.25	2.29	14.0
13.85	7.00	19.3	4.92	2.15	8.5
13.66	6.56	19.3	4.84	2.11	4.6
13.02	6.20	19.5	4.78	2.08	2.2
12.25	5.79	19.2	2.51	1.10	1.8
11.56	5.42	19.1	1.02	0.43	1.6
10.74	4.98	19.0			

As stated above, quinine sulphate when exposed to the air takes up or loses water until its vapor pressure is in equilibrium with the vapor pressure (humidity) of the air in the room. Since the octohydrate has a vapor pressure close to that of water (corresponding to a humidity of about 82% at 25° C.) it will lose water unless exposed to very moist air. The dihydrate on the other hand would be in equilibrium with the air only under desert conditions. Inspection of the accompanying curve shows that under ordinary conditions equilibrium with water vapor in the air will be reached somewhere on the sharp break in the curve and that quinine sulphate stored in an open container will contain slightly more than 2 moles of water.

CONCLUSIONS.

By means of vapor pressure measurements it is shown that the water content of quinine sulphate is present as water of crystallization. Quinine sulphate crystallizes from water at room temperature with eight molecules of water of crystallization. This is not stable when exposed to the air and is transformed to the dihydrate. No evidence of quinine sulphate containing seven molecules of water of crystallization was found.

THE LEAVES OF PENTSTEMON COBÆA, NUTT.*,[1]

BY LOYD E. HARRIS AND RUTH ANN CONNER.[2]

Pentstemon cobæa, Nutt., of the Scrophulariaceæ family, is commonly called Beard-tongue (1), Cobacea (2) and Balmona (3). Nuttall discovered it in Arkansas in 1833 and named it cobæa in "Collection towards a Flora of the Territory of Arkansas" (4) in 1834. It is still widely distributed in calcareous soil from Missouri to Central Texas, where in the malarial districts its use for prevention of "the chills" is still practiced according to Indian custom. It is said to have been used in the Chickasaw nation as a cathartic. Some use the entire plant but the majority of the laity make a "tea" from either the freshly gathered or the dried leaves and take it in one teaspoonful doses as a tonic.

Fig. 1.—Pentstemon Cobæa. (Picture taken northeast of Norman, Okla., 1932.)

EXPERIMENTAL.

The leaves were collected June 20, 1931, soon after flowering had ceased. Only leaves of the flowering stem were gathered as the basal leaves live all winter. A sample collected in 1932 was used in a comparison of moisture determinations (5).

	Wt. of Sample.	Gm. Lost.	Per Cent Moisture.
1931	10.0038	0.9323	9.52
	10.0025	0.9590	9.58
1932	5.0	0.5055	10.11
	5.0	0.5044	10.08

Ash determinations according to the method of the Association of Official Agricultural Chemists gave the following results:

Wt. of Sample.	Total Ash.	Water-Sol. Ash.	Insol. Ash.
2.0 Gm.	8.36 per cent	2.75 per cent	5.61 per cent
2.0 Gm.	8.16 per cent	2.76 per cent	5.39 per cent

Extraction with selective solvents was carried out according to the method of Dragendorff (6), using some modifications, with the following results.

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* Scientific Section, A. PH. A., Madison meeting, 1933.

[1] An abstract of a thesis submitted to the Graduate School, The University of Oklahoma, in partial fulfilment of the requirements for the degree of Master of Science in Pharmacy.

[2] Graduate assistant in Pharmacy.

Solvent.	Sample No. 1. 10.6594 Gm.	Sample No. 2. 11.6613 Gm.	Per Cent. Sample No. 1.	Per Cent. Sample No. 2.
Pet. ether	0.0445	0.0490	0.41	0.42
Ether	0.1445	0.1514	1.35	1.29
Alcohol	1.7427	1.9054	16.34	16.34
Water	2.0050	2.1970	18.81	18.97
Dil. alkali (2 per cent)	2.3710	2.5890	22.25	22.21
Dil. acid (1 per cent)	1.3222	1.4824	12.42	12.37
Crude fibre	1.7830	1.9292	16.61	16.55
Moisture	(Previously determined)		9.55	9.55
Total	9.5445	10.5051	97.54	97.50

ALCOHOLIC EXTRACT.

During the preliminary extraction, crystals were noticed in the alcoholic extract, as the alcohol was allowed to evaporate spontaneously. In order to get enough of this material for study two large samples, or a total of one thousand one hundred fifteen and one-tenth grams of the ground leaves were exhausted with petroleum ether, then extracted with dehydrated alcohol. The results were:

Weight of sample	490.1 Gm.	625.0 Gm.
Total residue	78.8815 Gm.	101.08 Gm.
Per cent extracted	16.09 Gm.	16.17 Gm.
Impure crystals separated	3.0 Gm.	15.2 Gm.

The impure crystals were separated and washed with warm dehydrated alcohol. The use of a suction filter was found necessary. The washing was continued until no more green color was removed. After taking up in hot dehydrated alcohol the solvent was allowed to evaporate spontaneously. The crystals appeared cream colored and had a characteristic, although faint, sweet taste.

Solubility of the Crystals.

Readily soluble in warm	Glycerine, Water
Slightly soluble in hot	Methyl Alcohol, Benzene
Fairly soluble in hot	Amyl Alcohol, Acetone; Ethyl Acetate
Readily soluble in boiling	Ethyl Alcohol, Isopropyl Alcohol
Insoluble	Acetic Acid

The melting point of the crystals was 163° C. (unc.). After repeated recrystallization the melting point was unaltered, however after boiling with water a substance was separated giving a different melting point (70–72° C.). Crystals from the filtrate continued to meet at 163° C.

An aqueous solution (1–20, W/V) had no effect on polarized light.

The crystals did not reduce Fehling's solution and the results were still negative after attempts to hydrolyze them with diluted hydrochloric acid in a sealed glass tube. Qualitative analysis showed the absence of sulphur, nitrogen, chlorine, bromine and iodine.

PHARMACEUTICAL PREPARATIONS.

Since *Pentstemon cobæa* is administered medicinally in the form of a "tea" it was decided to prepare pharmaceutical preparations that would represent the constituents expected to be found in the tea.

A decoction prepared according to the U. S. P. directions and then evaporated to dryness gave the following results:

	Wt. of Powdered Leaves.	Wt. of Residue.	Per Cent of Water-Soluble Extractives.
Sample No. 1	5.0 Gm.	1.9325 Gm.	38.65
Sample No. 2	5.0 Gm.	1.9403 Gm.	38.80

An infusion was also prepared according to the general formula of the U. S. P. and the total water-soluble contents determined. The results were:

	Wt. of Powdered Leaves.	Wt. of Residue.	Per Cent of Water-Soluble Extractives.
Sample No. 1	5.0 Gm.	1.8794 Gm.	37.58
Sample No. 2	5.0 Gm.	1.8809 Gm.	37.61

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(2) A preliminary list of the Fern and Seed Plants of Oklahoma. "Jeffs and Little, Biological Survey," Vol. II, No. 2, page 80.

(3) So-called by people using the plant medicinally.

(4) *Trans. Amer. Philo. Soc.*, New Ser. V, 22 (1837), 182.

(5) Oven method, U. S. P. X.

(6) Plant analysis by Dragendorff (trans. by Greenish).

FROM THE LABORATORY OF THE SCHOOL OF PHARMACY,
THE UNIVERSITY OF OKLAHOMA, NORMAN, OKLAHOMA.

NATHANIEL LORD BRITTON.

In the following sketch, Dr. H. H. Rusby's tribute to Nathaniel Lord Britton, in *Science*, August 3rd, is quoted, in part:

"This learned and productive scientist, whose death occurred on June 25th, in his seventy-fifth year, was in all respects a son of the state and city in which he lived and died. Born and bred in Staten Island, of local ancestry, his early life and interests, which even in childhood were directed toward nature loving and studying, were closely bound up with the life of that island and have left their eternal imprint on the scientific and educational character of its community.

"While the scientific world will be content to read and refer to his published works, we, who knew him more intimately, may do well to look behind the work and consider the conditions under which it was performed and the manner of its doing and form an estimate of the character and life of the man.

"Professionally educated at Columbia, he became connected with it as instructor immediately upon his graduation, and the educational relationship thus established continued throughout life. Into the affiliation of Columbia's faculty with the scientific activities of the city, Dr. Britton entered most heartily and soon he became recognized as one of the dependable supporters of the work of several of these societies. He became active in the proceedings of both the Linnæan and Microscopical societies, but his special interest was in the academy and the Torrey Botanical Club, the successful development of both of which has been largely due to his service and influence, at the same time that he was equally active in the work of the now flourishing Natural History Association of Staten Island. His later connection with the Botanical Garden, a city institution, brought him into close relations with the city government, so that he became associated with many of those who have conducted its political and financial affairs for a third of a century. Thus, while the many interests in this and foreign countries which have profited by his labors will feel his loss as a scientist, our city will also miss him as an active and distinguished citizen."

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Compiled by A. G. DuMez, Reporter on the Progress of Pharmacy.

All articles in these lists will be presented in abstract form in the bound volumes of the YEAR BOOK, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. W. cor. Lombard and Greene Sts., Baltimore, Maryland.

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PHYTOCHEMICAL LITERATURE.*

BY EDWARD KREMERS.

Friedrich Rochleder was born May 15, 1819, in Vienna, the son of the apothecary Anton Rochleder. He died Nov. 5, 1874, as professor in the University of the capital of Austria.

Not satisfied with the routine of the apothecary shop, he began the study of medicine in his native city, receiving the doctor's degree in 1842. While thus engaged he took a special liking to chemistry for which his pharmaceutical apprenticeship had prepared him in part. Hence, after the completion of his medical studies he went first to Prag and then to Giessen. His knowledge of vegetable drugs and of botany coupled with his chemical training under Liebig caused him to specialize in phytochemistry toward which most of his experimental and literary efforts were directed.

Having spent several months in Paris and London, at the age of 26 he was appointed Professor of Technical Chemistry at the Academy at Lemberg. In 1849 he succeeded his friend Redtenbacher at Prag, whom he again succeeded in Vienna in 1870.

A fairly complete list of his publications may be found in Poggendorff's *Biographisch-literarisches Handwoerterbuch*. It is noteworthy that, whereas the more general literary productions appeared between 1847 and 1858, his activities after the latter date were restricted to more specific investigations. Optimistic as he was with regard to the fundamental importance of phytochemistry to plant physiology, he realized that only a mere beginning had been made and that much more detail work was necessary before worth-while generalizations could be indulged in with profit.

His literary contributions in book form are:

* Section on Historical Pharmacy, A. PH. A., Toronto meeting, 1932. Continued from JOUR. A. PH. A., 21, 365.

1847. *Beitrage zur Phytochemie.*
1852. *Die Genussmittel und Gewuerze in chemischer Beziehung.*
1854. *Phytochemie.*
1858. *Chemie und Physiologie der Pflanzen.*
1858. *Anleitung zur Analyse von Pflanzen und Pflanzentheilen.*

The last was translated into English and appeared as *Proximate analysis of plants* in 1861 and 1862.

The biography for the *Allgemeine Deutsche Biographie* was written by Anschuetz. It is evidently based on the more detailed account written by Rochleder's student and friend, H. Hlasiwetz, for the *Almanach der kaiserlichen Akademie der Wissenschaft* for 1875 (pages 195–212), of which society Rochleder had been a member since 1848. This "Nekrolog" was reprinted in the *Berichte der d. chem. Gesellschaft*, for 1875, *viz.*, in Vol. 8, page 1702.

Fr. Rochleder.—Beitraege zur Phytochemie. Wien, 1847. Aus der kaiserl. koenigl. Hof- und Staats-Druckerei. One vol. 8°, pages 51.

This is Rochleder's first attempt to rationalize the numerous observations made in the chemical study of plants and parts of plants. Liebig's theory of radicles, the "true elements" of organic compounds, afford him the means of studying the structure of phytochemical substances and of seeking genetic relationship between them. That, with the limited number of radicles known at the time, there should be so many organic substances produced in the vegetable kingdom, he attributes not only to their capacity to combine with different elements and radicles, *e. g.*, oxygen, sulphur, cyanogen, sulphocyanogen, etc., but above all to their capacity to form "gepaarte Verbindungen" such as salicin, amygdalin, etc. (page 22).

The complaint that so much of phytochemical investigation has been merely qualitative and not quantitative is readily understood when one considers that elementary organic analysis, as simplified and perfected by Liebig, had been in use for about twenty years. It finds expression in the small number of phytochemical substances enumerated with their formulas. The modern chemist, however, will be impressed less with the paucity of formulas than with the daring formulas assigned to pectin and other members of the "carbohydrate group."

Following the trend of v. Uslar and de Saussure, more than half of the small treatise is devoted to what is generally conceived as phytophysiological considerations. In the biochemistry of the plant he recognizes desoxidation as the principal function or chemical process of plant metabolism.

Inasmuch as this treatise has become rare, the table of contents may here be given.

Ueber die Zusammensetzung der organischen Bestandtheile der Pflanzen im Allgemeinen (pages 7–11).

Ueber die Zusammensetzung der Pflanzenstoffe im Besonderen (pages 11–22).

I. Familie. Kohlehydrate.
II. Familie. Fettsäuren.
III. Familie. Gerbstoffe.
IV. Familie. Lichenyle.
V. Familie. Tetryle.
VI. Familie. Decatryle.
VII. Familie. Camphene.
VIII. Familie. Bioxyde.
IX. Familie. Æther.
X. Familie. Acrodyle.
XI. Familie. Albumincide.
XII. Familie. Alcaloide.
XIII. Familie. Gepaarte Verbindungen.

Ueber die Metamorphosen, welche die Stoffe in den Pflanzen während des Lebens derselben erleiden (pages 23–45).

Einjährige und perennirende Gewächse (page 46).

Ueber die Vertheilung der Pflanzenstoffe in den Pflanzen (pages 47–49).

Schluss (pages 49–51).

Fr. Rochleder.—Phytochemie. Leipzig. Verlag von Wilhelm Engelmann, 1854.

This attempt at a general phytochemistry in which the author was the pioneer, is best revealed by the table of contents. The bulk of the work is devoted to a record of constituents, by no means all chemical units, that had been isolated from plants. The author points out that the gaps are much more numerous than the known constituents and he indicates constantly where more work seems desirable and profitable. This part of the book is, therefore, a sort of precursor to Wehmer.

Part three is in its essence an attempt to bring out genetic relationships with reference to the several families. Even before Kekulé's theories were advanced, he endeavors to bring out what was regarded as structural relationship at that time.

Part four has to deal largely with what we call plant metabolism, of some of the details of which the following table of contents will give further indication.

Einleitung.

Erster Abschnitt. Analysen der Pflanzen, mit besonderer Rücksicht auf ihre organischen Bestandtheile (pages 1–250).

Zweiter Abschnitt. Analysen der Pflanzen, mit alleiniger Berücksichtigung ihrer unorganischen Bestandtheile (pages 251–255).

Dritter Abschnitt. Ueber den Zusammenhang zwischen der Form und Zusammensetzung der Gewächse (pages 257–308).

Vierter Abschnitt. Der Stoffwechsel in den Pflanzen (pages 309–344).

I. Nahrungsmittel der Pflanzen.
II. Bestandtheile der Pflanzen.
III. Metamorphosen in den Pflanzen.
IV. Bewegung der Stoffe und ihre Folgen.
V. Einfachheit der Zusammensetzung der Pflanzen.
VI. Das Verhältniss der organischen zu den unorganischen Bestandtheilen der Vegetabilien.
VII. Perioden im Stoffwechsel.
VIII. Pflanzengeographie.

Anhang (pages 345–370).

Alphabetisches Verzeichniss der bis jetzt, ihrer Zusammensetzung nach, bekannten Bestandtheile der Pflanzen.

Index familiarum.

Index generum.

Reviews of this work may be found in the following journals:

Arch. de. Pharm., 133, 335, by H. Bley (8 pages).
Neues Jahrb. f. Pharmacie, 18, 355, by Reinsch.

Fr. Rochleder.—Chemie und Physiologie der Pflanzen. Heidelberg. Karl Winter, 1858.

In this, his last attempt, the author discusses phytochemistry from two points of view, namely, that of chemical botany, and that of the chemical physiology of plants.

In the first part, which constitutes the major portion of his treatise, the chemical constituents of plants, as revealed by so-called plant analysis, are arranged

according to botanical families, genera and species. In this respect he supplements the first part of his *Beitræge zur Phytochemie*. However, what, in the first attempt, is regarded as one of the principal aspects of phytochemistry, namely, the genetic relationship of chemical compounds based on their structure, receives no consideration whatever. His chemical botany is but a catalog of phytochemical substances with references to original literature for details.

The character of the second part becomes sufficiently apparent from the table of contents. It also goes into much greater detail than his *Beitræge* of 1847. The object of the chemical physiology of plants is to investigate "which substances are taken up by plants from without, which products are produced therefrom by the plant, the method by which the plant metamorphoses the substances taken up from without, and the products that are secreted by the plant."

The contents of the volume are herewith revealed:

Einleitung (pages 1–7).

(A) Chemische Botanik (pages 7–98).

Analysen vegetabilischer Körper.

I. Vegetabilia dicotyledonea.
II. Vegetabilia monocotyledonea.
III. Vegetabilia vascularia cryptogama.
IV. Vegetabilia Cellularia.

(B) Chemische Physiologie der Pflanzen (pages 99–152).

I. Endprodukte des Stoffwechsels.
II. Nahrungsmittel der Pflanzen.
III. Aufnahme der Nahrungsmittel und Vertheilung der Stoffe in den Pflanzen.
IV. Ueber den aufsteigenden und absteigenden Saftstrom.
V. Eigenwärme der Gewächse und Bedeutung der Wärme und des Lichts fuer die Pflanzen.
VI. Licht.
VII. Electricität.
VIII. Keimen der Samen.

Anhang. Ueber das Reifen der Früchte (pages 153–154).

AUGUST HEINRICH HUSEMANN.

The younger of the two cousins Husemann was born Sept. 5, 1833 in Stolzenau, Hannover, then an independent kingdom. His early education he received in private institutions and at the gymnasium in Detmold. In 1848 he was apprenticed to the court apothecary in Detmold. Later he acted in the capacity of assistant in Lamspringe, Aurich and Nienburg. In 1857 he became a student at Goettingen where he passed the state board examination in the following year. Devoting himself to the study of chemistry, he worked under Woehler and Limpricht and in 1860 was appointed assistant at the newly equipped physiological chemical laboratory. In the same year, Aug. 8th, he received the doctor's degree and in 1862 he became docent for pharmaceutical-juridical chemistry.

Lung troubles necessitated residence in Italy during the winter of 1863/64. He returned to Goettingen but for a short time, having received a call to the "Kantonschule" in Chur. Whereas in Goettingen his researches were devoted to phytochemistry, in Chur they dealt with the investigation of the mineral waters of Graubuenden. Poor health necessitated his withdrawing from active work. He died in Thusis (Graubuenden, Switzerland) July 17, 1877.

A list of his book and journal publications will be found in Poggendorff, *Biogr. lit. Handwoerterbuch*, Bd. III.

Phytochemically his *Pflanzenstoffe*, which appeared in 1870–1871, is his principal contribution to scientific literature. It was well received. A second edition which appeared after his death, 1882, was edited by A. Hilger and Th. Husemann.

The biographical sketch in the *Allg. Deutsche Biographie*, by A. Ladenburg, is based on the obituary in the *Arch. Pharm.*

ALBERT HILGER.

Born May 2nd in Hamburg, Rhenish Palatinate, he served his pharmaceutical apprenticeship with the apothecary Joh. Hoffmann in Langenkandel, Rhenish Palatinate. Having passed his assistant's examination, he served for three years in this capacity in Mannheim, Karlsruhe and Saarbruecken. He studied in Wuerzburg (1860) where he passed his "Staatsexamen" in 1862; also at Heidelberg, at which university he received his doctor's degree (Ph.D.). He then became Schenk's assistant in Wuerzburg, later the assistant to Scherer, and in 1869 "Privat-docent." In 1872 he was appointed Professor of Pharmacy and Applied Chemistry in Erlangen. Twenty years later he became Buchner's successor in Munich. He died May 18, 1905, in Possenhefen on the Starnberger lake.

For additional biographical data with portrait, also for a long list of his book and journal publications, see B. Reber, *Gallerie*, etc., pages 218 and 363. An appreciation, more particularly of his life-long interest in pharmacy and food chemistry was written by Heger, editor of the *Pharmaceutische Post*, No. 23, 1905.

Poggendorff gives but a brief notice of his life and work (Bd. III). The *Allgem. Deutsche Biogr.* does not mention him.

THEODOR HUSEMANN.

The older of the Husemann cousins was born Jan. 13, 1833, in Detmold, Lippe. From his father, an ex-apothecary whose hobby was botany, he acquired a love for the natural sciences. These he studied, in addition to the required medical subjects at the universities of Goettingen (1850–1852), Wuerzburg (1852–1854) and Berlin (1854). From the last-named institution he received the M.D., Dec. 27, 1854.

After several years as medical practitioner, he returned to Goettingen devoting himself to toxicological and pharmacological studies. During the winter 1863–1864 he accompanied his sick cousin to Italy. Early in 1865 he became "Privat-docent" for Pharmacology and Toxicology at the *Georgia Augusta* and in 1872 he was made professor.

As medical practitioner, Husemann became active in a literary capacity writing on various subjects of medical history. As toxicologist and pharmacologist he wrote extensively on subjects related to these fields. With his cousin he edited the first edition of the *Pflanzenstoffe* (1869–1871). After his cousin's death, a second, enlarged edition was published in coöperation with A. Hilger. A promised third edition did not make its appearance.

He died Feb. 13, 1901.

For more detailed biographical data with portrait, also references to other publications, see B. Reber, *Gallerie*, etc. (1897), 63.

Poggendorff contains but a brief note on his life and literary activities. The *Allgem. Deutsche Biogr.* does not mention him.

A more extensive biographical account will be found in the *Pharmazeutishe Zeitung:* see 32 (1887), 443 and 451; also 46 (1901), 147.

Aug. Husemann, und *Theod. Husemann.—Die Pflanzenstoffe in chemischer, physiologischer, pharmakologischer und toxikologischer Hinsicht.* Fuer Aerzte, Apotheker, Chemiker und Pharmakologen bearbeitet. One vol., pages vii, 1178. Berlin, 1871. Verlag von Julius Springer.

One of the authors, presumably August H., undertook the editing of the chemical part of the work, the other, presumably Theodor H., that of the pharmacological, etc., parts of the volume. While such mixtures as volatile and fatty oils, resins, etc., receive consideration, extracts and other galenical preparations of plants are excluded. The book apparently filled a long-felt want on the part of chemist and apothecary though it was also written for the medical profession.

The arrangement, of special interest so far as date of publication is concerned, becomes apparent from the table of contents:

Einleitung	1– 18
(A) Reine Verbindungen	
1. Die Pflanzenbasen oder Alkaloide	19– 522
2 u. 3. Die Pflanzensaeuren und indifferente Pflanzenstoffe	523–1073
(B) Gemenge.	
Aetherische Oele—Harze—Fette	1074–1167
Register	1069–1178

As a means of subclassification the plant substances are arranged according to plant families.

Contemporary appreciation and criticism of this work may be learned from the following book reviews:

Arch. Pharm., 194, 282. By E. Hallier.

Am. J. Pharm., 42, 315. By J. M. Maisch.

After the death of Aug. Husemann in 1877, his cousin associated himself with A. Hilger. Of the three authors of *Die Pflanzenstoffe*, two began their scientific careers as pharmacists. The third was the son of an ex-apothecary and had inherited from his father a love for the natural sciences which he cultivated while pursuing his medical studies. The second edition was published in two volumes. The arrangement of the subject matter was altered as becomes apparent from the rearranged table of contents:

I. Algemeiner Theil.

(A) Chemische Vorgaenge im pflanzlichen Organismus. Entstehung organischer Substanz (pages 3–11).

(B) Chemische Charakteristik der Pflanzenstoffe (pages 12–72).

Kohlenhydrate.
Glycoside.
Bitterstoffe und Farbstoffe.
Gerbsaeuren (Gerbstoffe).
Pectinstoffe.
Pflanzensaeuren.
Die Pflanzenbasen oder Alkaloide.
Fette (Wachsarten).
Aetherische Oele.
Campher.
Harze (Balsame).
Proteinstoffe.

(C) Wirkung und Anwendung der Pflanzenstoffe (pages 73–100).

II. Specieller Theil.

(A) Allgemein verbreitete Stoffe.

1. Unorganische Bestandtheile der Pflanze (pages 103–105).
2. Kohlenhydrate (pages 106–188).
3. Organische Saeuren allgem. Verbreitung (pages 188–261).
4. Eiweisstoffe (Proteinkoerper) (pages 231–236).
5. Ungeformte Fermente (pages 237–240).
6. Pflanzenfarbstoffe (pages 241–261).
7. Amidoverbindungen (pages 263–272).

(B) Pflanzenstoffe beschraenkter Verbreitung (pages 273–1543).

It is also noteworthy that the bulk of the treatise is devoted to plant substances of limited distribution. Apparently it was Hilger who edited the chemical part after the death of Aug. Husemann.

Book reviews may be consulted in the following journals:

Pharm. Ztg., 29, 323. By A. Tschirch.

E. EBERMAYER.

Ernst Wilhelm Ferdinand Ebermayer was born Nov. 2, 1829, in Rehlingen near Pappenheim, Bavaria. His life-work in forestry was carried on primarily as professor at the *Forstlehranstalt* at Aschaffenburg (since 1858) and at the University of Munich (since 1878). He is referred to as the founder of forest meteorology and forest chemistry. For his book and journal publications on these and related subjects, see Poggendorff, *Biogr.—litterarisches Handwoerterbuch* Bd. III, page 396. His *Physiologische Chemie der Pflanzen* appeared in 1882. He died Aug. 12, 1908, in Hintersee near Berchtesgaden.

The *Allgem. Deutsche Biogr.* does not include his biography. Brief accounts will be found in the *Konversations-Lexika* of Brockhaus and Meyer. See also the supplement to the latter.

Physiologische Chemie der Pflanzen. Zugleich Lehrbuch der organischen Chemie und Agrikulturchemie fuer Forst- und Landwirthe, Agrikulturchemiker, Botaniker, etc. Von Dr. *Ernst. Ebermayer.* Erster Band. Die Bestandtheile der Pflanzen. Berlin. Verlag von Julius Springer. 1882.

Inhaltsübersicht.

Die Bestandtheile der Pflanzen.

Erster Abschnitt. Wassergehalt der Pflanzen. (Vorkommen, Vertheilung, etc., quantitative Bestimmung, pages 2–29).

Zweiter Abschnitt. Die organischen oder verbrennlichen Bestandtheile der Pflanzen (pages 30–708).

Allgemeine Betrachtungen.

(A) Die stickstofffreien Erzeugnisse der Pflanzen.

I. Verbindungen aus der Klasse der Fettkörper.
   Kohlenwasserstoffe.
   Alkohole.
   Kohlenhydrate.
   Organische Säuren.

II. Verbindungen aus der Klasse der aromatischen Körper.
   Kohlenwasserstoffe.
   Phenole.
   Aromatische Alkohole and Aldehyde.
   Aromatische Säuren.

Die wichtigsten Gerbmaterialien des Handels.
Aetherische oder flüchtige Oele.
III. Pflanzenstoffe von unbekannter Constitution.
Glycoside.
Bitterstoffe.
Harze.
Balsame oder flüssige Harze.
Eigentliche Harze (Hartharze).
Gummiharze.
Pflanzenfarben.
(B) Die stickstoffhaltigen Erzeugnisse der Pflanzen.
Pflanzenbasen oder Pflanzenalkaloide.
Proteinstoffe, Eiweisskörper oder Albuminate.
Nicht-eiweissartige stickstoffhaltige Pflanzenbestandtheile (Amidverbindungen).
Fermente.
Dritter Abschnitt. Die anorganischen oder Mineralbestandtheile der Pflanzen (pages 709–836).
Vorkommen, Einäschern, Aschen-Analysen, etc.
Betrachtung der einzelnen anorganischen Pflanzenbestandtheile.
Anhang.
I. Bedeutung der Wälder fuer die chemische Industrie
(Gewinnung von Potasche, Holzkohle, Holzessig, etc.)
II. Nachträge.
III. Tabelle.

A METHOD OF PREPARING GLYCERITE OF STARCH.*

BY F. L. GEILER.

INTRODUCTION.

The purposes of this article are: (1) to describe a simplified method of preparing Glycerite of Starch, (2) to show wherein this method differs from the present U. S. P. X method of preparing this glycerite, and (3) to show why the difference or differences mentioned above will be advantageous.

The writer has, for a number of years, assigned Glycerite of Starch as one of the preparations to be made by students in the laboratory. The observations made over this period of years led to the conclusion that undue difficulty was being experienced by the students in making a comparatively simple preparation. The trouble met with has been primarily that of obtaining a smooth, opalescent, translucent product by following the directions given for this preparation in the U. S. P. X. This primary difficulty usually has led to one of a secondary nature due to the effort made to obtain a temperature of around 140° C. with the resultant scorching of the glycerite. Upon questioning the students, almost invariably the scorching has been found to be the result of the use of high heat under the impression that it will eliminate the lumpy condition of the glycerite which has developed because of following the directions as given in the U. S. P. X.

During the time referred to above many students used the method of the U. S. P. X and repeated the experiment as high as three or four times before a satisfactory glycerite was obtained. This always seemed to the writer an uncalled-

* Section on Practical Pharmacy and Dispensing, Washington meeting, 1934.

for waste of time and materials on a preparation which, as has been said before, should be rather simple.

EXPERIMENTAL WORK.

The conditions and results, as generally outlined above, led the writer to conduct experiments on this preparation. At first one group of students was allowed to prepare the glycerite as directed in the U. S. P. X. The results were very unsatisfactory, many repetitions occurring due to a lumpy or a discolored preparation. The same group was then directed to prepare the same glycerite by the method to be described subsequently. The results obtained by using the second method were practically 100% as to smoothness, opalescence and translucency. The above methods of preparation were repeated a year later and the same results obtained. The writer, personally, has performed the same experiments with the resultant corroboration of those given above.

The method proposed is as follows: Ten grams of starch were weighed out and mixed with 20 cc. of cold water until a homogeneous mixture was obtained. Glycerin, to the volume of 70 cc., was poured into a small evaporating dish. The aqueous starch mixture was then added to the glycerin and the entire volume was stirred until homogeneity was again obtained. The evaporating dish and contents were then placed in a sand-bath on an electric hot plate. The temperature was so regulated that the heat increased rather slowly and the preparation was stirred almost constantly. The highest temperature registered inside the evaporating dish was 110° C. The total time of making the glycerite, from weighing and measuring to removing from the hot plate, inclusive, was just one hour. Equally satisfactory results can be obtained by using a Bunsen Burner in place of an electric hot plate.

CONCLUSION.

In view of the foregoing, I wish to call attention to the following conclusions:

(1) The proposed method of preparation is less troublesome than that used in the U. S. P. X.

(2) This method requires practically no care other than constant stirring and temperature control.

(3) Lumpiness and discoloration in the finished product are eliminated due to the fact that all ingredients are heated together at the same time and to the same temperature.

(4) The present U. S. P. X method is unsatisfactory because it gives a lumpy product and possibly a discolored one, due to the glycerin being heated far above the aqueous starch mixture when the latter is added.

LABORATORY OF THE PHARMACY DEPARTMENT,
WEST VIRGINIA UNIVERSITY, MORGANTOWN, W. VA.

A JAPANESE PHARMACIST MUST CERTIFY IMPORTED MEDICINALS AND CHEMICALS SOLD IN JAPAN.

The marketing of cosmetics, manicure preparations and medicinal preparations in Japan is contingent upon the issuance of a government license for such sale. A license may be obtained by submitting samples to proper authorities, accompanied by a chemical analysis of the product which has been certified to by a licensed Japanese druggist. (Consul General Garrels, Tokyo.)

A STUDY OF VEHICLES FOR MEDICINES.*

BY BERNARD FANTUS, H. A. DYNIEWICZ AND J. M. DYNIEWICZ.

VII. AROMATIC SYRUP OF ACACIA.

In the course of our studies on vehicles we have secured abundant proof that colloidality has distinct disguising value. We, therefore, became interested in syrup of acacia which might be taken to represent colloidality to as high a degree as can be found in any pharmaceutic preparation.

The deletion of this syrup from U. S. P. VIII might possibly count against it in consideration as an eligible vehicle. This deletion, we believe, was chiefly due to its poor keeping qualities. In spite of the deletion, however, its usage, as shown by the Gathercoal survey, has been 15 per 10,000, which would entitle it to admission to the National Formulary merely on the basis of its use.

That the syrup of acacia has disguising value can very easily be proved among other ways, by the following prescription for urea as a diuretic.

℞	Urea	15.0 Gm.
	Syrup of Acacia, to make	60.0 cc.

M. and label: Teaspoonful in water every 4 hours.

The taste of urea is sharp and much more disagreeable when the solution is made with simple syrup instead of the syrup of acacia. Similar results could be secured with any readily soluble and highly diffusible medicament, that has no intrinsically unpleasant taste. We were indeed unable to find anything that was superior to or as good as the syrup of acacia for the disguising of urea, excepting that the lack of flavor gave one the impression of "flat taste" which might be possibly one of the reasons why the syrup of acacia is not more popular.

We felt, therefore, that, to improve the syrup of acacia and increase its utility, we would have to do two things: *First*, impart to it keeping qualities; and, *secondly*, give it a pleasant flavor.

To improve the keeping qualities of this syrup, we increased as a first step the proportion of sugar from 80 to 85 parts per 100 which can be done by merely dissolving the powdered acacia directly in the syrup: there being no necessity of dissolving the acacia separately as was done in U. S. P. VIII. To make assurance doubly sure, however, we would suggest the addition of 1 to 1000 of sodium benzoate, so as to protect the medicine against spoiling, even if the doctor had to use a little water in order to dissolve the medicament he intends to introduce in the syrup.

It is strange that the delicious wintergreen flavor has thus far not been made use of in the production of vehicles. After trying a number of flavors, it seemed clear to us that methyl salicylate was the ideal flavoring vehicle for the syrup of acacia; and we have the belief that, by using it for making the syrup of acacia more pleasant, we are at the same time enriching our flavoring resources to an important degree.

As a result of these considerations and on the basis of our experimentations we herewith, respectively, suggest the following formula for admission to either the United States Pharmacopœia or the National Formulary.

* From the Laboratory of Pharmacology of the University of Illinois, College of Medicine.

SYRUPUS ACACIÆ AROMATICUS.

Aromatic Syrup of Acacia.

Syr. Acac. Arom.

Acacia, in fine powder	**100.0 Gm.**
Sodium Benzoate	**1.0 Gm.**
Methyl Salicylate	**1.0 cc.**
Syrup, a sufficient quantity, To make	**1000.0 cc.**

Mix the acacia, placed in a dry mortar, with the sodium benzoate. Add the syrup, at first in small portions, with active trituration, so as to avoid the formation of lumps; and, gradually, the remainder of the syrup. Bring the preparation to a boil and when cool strain through cheese cloth. Finally incorporate the methyl salicylate by thorough agitation and add enough syrup to make the product measure 1000 cc.

HOW MUCH IS A TEASPOONFUL?*

BY F. W. NITARDY.

During the last twenty years considerable effort has been made toward more accurate standardization of medicinal products. Tolerances have also been developed for individual dose forms such as tablets, capsules, ampuls, etc., and these tolerances, determined upon very largely by a committee of the A. D. M. A. and A. P. M. A., have received official sanction from the Department of Agriculture and other bodies. In view of this effort for accuracy in potency and dosage, it appears wise to again give consideration to the dose measure most commonly used by the public in the use of liquid medicinal substances, namely, the teaspoon.

Efforts have been made from time to time to supplant the teaspoon with an accurately graduated medicine glass, and while such idea is laudable it has met with little success, probably because of the convenience of the teaspoon and the almost universal habit on the part of the public to use it and, possibly, its belief that it represents a reasonably accurate measuring device for such purposes.

Originally, a teaspoonful was considered the equivalent of the fluidram and because a fluidram is approximately 4 cc., the equivalent of 4 cc. for a teaspoonful has been more or less generally accepted since the metric system became official, notwithstanding that it is quite an incorrect equivalent. Unfortunately, this incorrect equivalent has official sanction, but a survey of literature indicates that attempts have been made to adopt the more nearly correct equivalent of 5 cc., also that these efforts received the approval of both the pharmaceutical and medical professions, but for some reason not clear failed in being adopted by the U. S. P., which still gives the approximate measure of a teaspoon as 4 cc.

"Arny's Principles of Pharmacy" (Second Edition, 1924) states, "A teaspoonful is supposed to be one fluidrachm." "Remington's Practice of Pharmacy" (Seventh Edition, 1926) states, "A teaspoonful is estimated as 4 cc. In almost all cases, the modern tea cups, tablespoons, dessert spoons and teaspoons after careful test by many authorities were found to average 25%

* Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1934.

greater capacity than the theoretical quantities given above." "The American Illustrated Medical Dictionary," Dorland (Sixteenth Edition, 1932), defines a teaspoon as "A spoon of small size containing about 1 fluidrachm or 4 cc."

In Europe the average content of a teaspoon is quite generally recognized as 5 cc., that figure being given in the French Codex, in the German Pharmacopœia VI (1926), the Danish Pharmacopœia VIII (1933) and in the Swiss Pharmacopœia (1933). The British Pharmacopœia includes a statement regarding the inaccuracy of dosages expressed in teaspoonfuls and dessertspoonfuls and recommends that dosages should be specified in terms of more definite units. This Pharmacopœia does not give any capacity for a teaspoon. A number of articles on this subject have been published during the present century. Abstracts of these are as follows:

Standardizing Dose Measures.[1]—Attention is called to possible errors caused by the inaccuracy of medicine measures and that by the fact that these measures are poorly adapted for accurately measuring liquids in small quantities. The author proposes certain regulations which had previously been adopted at a pharmaceutical meeting of the Philadelphia College of Pharmacy. These resolutions recommended the use of graduated glass dose-measures so constructed that the heights of the contained liquid at a spoonful mark would be greater than its diameter; that where spoons are used as medicine measures, the French Codex definition of a spoonful be applied. This definition reads as follows: "A spoon is full when the contained liquid comes up to but does not show a curve above the upward edge or rim of the bowl. The third recommendation was that 1 teaspoonful should be considered equivalent to 5 cc., 1 dessertspoonful 10 cc. and 1 tablespoonful 15 cc. These resolutions were seconded and adopted by the ASSOCIATION.

Dose Measures and Measured Doses.[2]—In a series of experiments it was shown that the average teaspoonful dose as measured with the same spoon by different people varied in measurement from 3 to 7 cubic centimeters. Medicine glasses were also found to be inaccurate, varying considerably at the different graduations and most of them being so constructed that small quantities could not be measured with accuracy.

The Approximate Measures of the U. S. P.[3]—Wilbert states that the resolutions endorsed by the ASSOCIATION in 1902 were also adopted by the American Medical Association in 1903, in spite of which the members of the Committee on Revision of the U. S. P. failed to adopt the measures recommended. Wilbert made permanent casts of the capacity of a number of different sizes of spoons in common use as follows: The bowl of the spoon carefully washed and perfectly dried was coated with a thin film of oil and then filled with the requisite quantity of dental plaster which had been previously mixed with sufficient quantity of water to give it the consistency of cream. The spoon was supported until the plaster had set. The weight of the cake was then determined and the capacity of the spoon calculated. It was found that teaspoons evenly filled had a capacity of from 4.4 to 5.5 cc. Wilbert recommends that the 5-cc. equivalent for teaspoon be generally adopted.

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[1] M. I. Wilbert, PROC. A. PH. A., 50 (1902), 408.
[2] M. I. Wilbert, *Am. J. Pharm.*, 74 (1902), 120.
[3] M. I. Wilbert, PROC., A. PH. A., 53 (1905), 301.

The Tyranny of the Teaspoon.[1]—Arguments very similar to those previously presented by Wilbert are given. Arny found that capacities of 9 teaspoons ranged from 3.8 to 7.8 mils. Only one of these approached the 4-mil. basis. All the others were closer to 5 mils. than to the 4-mil. mark.

Standard Teaspoon Needed.[2]—Examination of teaspoons of four different makes showed two to deliver 5.37 cc., one to deliver 7.39 cc. and one to deliver 4.22 cc. It is recommended that properly graduated glasses be used instead of teaspoons.

Variation in the Capacity of Teaspoons and Other Measures.[3]—Data are given showing the capacity specified by several pharmacopœias for the teaspoon, dessertspoon and tablespoon. Because of the variations which occur in these specifications, the author recommends international unification. Data as given showed a still greater variation in the capacities of these measures as actually found in general use.

The writer checked up on capacity of teaspoons recently and found the following. (Filled so the liquid is exactly level with the edge of the bowl.)

1.	Towle sterling teaspoon (Lady Diana)	5.0 cc.
2.	Community plate teaspoon (Patrician)	5.5 cc.
3.	Plated ware teaspoon (hotel ware)	5.0 cc.
4.	Plated ware teaspoon (restaurant)	5.0 cc.
5.	Plated ware teaspoon (5 and 10¢ store)	5.0 cc.
6.	Plated ware teaspoon (nondescript)	5.0 cc.

It will be seen from the above that of six representative varieties of teaspoons, five hold just 5 cc. and one 10% more than this. It is believed that the sterling silver spoon given under "1" above is quite representative of the capacity of sterling silver spoons available in the market to-day as manufactured by Towle, International, etc., and that the community plate spoon given under "2" is probably quite representative of the better class of plated ware available in the market to-day.

Aside from the above spoons, I also determined the capacity of a very old European teaspoon, definitely more than a hundred years old. This spoon held 4.4 cc. and it is my impression that old European spoons of this type are generally somewhat smaller and have a somewhat different shaped bowl than the teaspoon in common use in this country, but even this type of spoon seems to hold definitely more than 4 cc.

It would appear that in view of the foregoing a renewed effort should be made to induce the U. S. P. to recognize 5 cc. as the most nearly correct metric equivalent for an average teaspoonful.

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[1] H. V. Arny, JOUR. A. PH. A., 6 (1917), 1056.

[2] John L. Adams, *Bull. Pharm.*, 38 (1924), 17; YEAR BOOK OF THE A. PH. A., 13 (1924), 74.

[3] A. Schamelhaut, *J. pharm. Belg.*, 8 (1926), 1; through YEAR BOOK OF THE A. PH. A., 14 (1925), 30.

VISIT THE CENTURY OF PROGRESS.

Pharmacists, visiting the World's Fair, should see the Pharmacy Exhibit and register, thereby showing their interest and loyalty to the profession.

A PROFESSIONAL PHARMACY.*

BY ROBERT R. GAW.

The McKennan Pharmacy was founded in 1861. It was located for many years at 431 Market Street, Pittsburgh. In 1910, Mr. O. F. Wolf, who worked as a boy in the store and became registered before branching out for himself, purchased a half interest in the store, and in 1914 purchased the other half.

In 1914 the McKennan Pharmacy moved to its present location 506–508 Penn Avenue and at that time discontinued the sale of soda water, proprietary medicines, candy, tobacco and toilet articles. These items were discontinued with the idea of attempting to operate a professional pharmacy and devote our energies exclusively to prescriptions.

We mention these historical facts to better enable us to visualize the progress of this business and its evolution from an ordinary drug store to a professional pharmacy. Many druggists as well as physicians from a distance, who visit the store, are under the impression that it is one of recent birth and that it represents an idea capitalized by big interests, and launched over night like the sensational developments in commercial retail stores.

The McKennan Pharmacy as a professional pharmacy is a result of years of development and of a radical departure from the deeply rooted customs of a business long established as a commercial drug store. This evolution was a result of adopting a policy of extremes in eliminating many of the departments and classes of merchandise usually found in average drug stores. When the McKennan Pharmacy decided to omit such lines as proprietary medicines, candy, cigars, soda water, tooth brushes and all toilet articles, we did it at a single stroke, and made it our business to acquaint the physicians with this action. Our intention was to impress upon them the fact that we were determined to exert all of our efforts to give undivided attention to professional pharmacy, and to render a service to the profession which we felt we could not deliver without eliminating the commercial end of our business.

Personal contact is a material factor in building a professional pharmacy. It is necessary to keep in personal touch with the physicians as well as your customers. We are in constant contact with the members of the medical profession of Allegheny County and its environs, and also in touch with their patients as they come into the store.

Many practicing physicians are not familiar enough with the Pharmacopœia and the simple pharmaceutical formulas. There is no easier way for a druggist, who is attempting to establish a professional pharmacy, to obtain the confidence of the physician than by impressing upon the physician's mind a knowledge of your profession.

We attribute our growth to the fact that the medical profession, as well as the public, appreciates the services rendered by a strictly professional pharmacy. We do no counter prescribing, nor do we fill any family recipes. We limit our activities to the compounding and dispensing of physicians' prescriptions and materials used by the physicians in their office practice. In addition, we supply sick-room necessities.

* Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1934.

Physicians are supplied with freshly distilled water gratis, which is greatly appreciated and although no immediate remuneration is received, their good-will and subsequent coöperation is noticeable.

Since adopting the policy we have before indicated, we have never hired any pharmacists. A boy enters the store as an errand boy and develops until of sufficient age to enter the school of pharmacy. If his preliminary education has not been sufficient, we supply him with the opportunity of adding sufficiently to his general education to enable him to enter the school of pharmacy, and then care for all his necessary expense in completing his pharmaceutical studies until he has passed the State Board. Hence our young men are always allied to, and enthusiastic for, the policy of the store. It is virtually bred in them. Through the adoption of this policy we have never lost one of our employees whom we have helped to educate.

Few organizations have a more enviable situation in this respect. There are four registered pharmacists at McKennan's, two always being on duty in the evenings and on holidays, and four on duty during the day. And yet McKennan's has not hired a pharmacist in fifteen years.

Commendation of our pharmacy by physician to physician and to patients, the personal interest they take in us, advertises us in a manner we could never accomplish through the daily press.

Any member of the profession of pharmacy who has learned its precepts and has practiced its ethics must clearly recognize the significant value of real professional service.

We do not think that the retrogressive motion so noticeable in the practice of pharmacy to-day is entirely the result of a lack of familiarity with the principles or ethics of the profession, but rather a desire to ignore these ethics because of the disposition of present-day drug stores to work along the lines of least resistance. They are influenced by the apparent prosperity of the commercial drug store, where the pharmacy department is relegated to an obscure corner of an institution which has all the earmarks of a variety shop or a miniature department store.

We expect within a short time to see an absolute separation of the professional pharmacy from the commercial pharmacy, with legislation covering each class as a separate institution.

The druggist who aspires to be a professional pharmacist should have all the information the physician should reasonably expect. Knowledge is the key-note of success in any line of endeavor, and the druggist who does not have complete knowledge of his profession cannot hope to make much impression on the members of the medical profession.

Professional pharmacies are developed only through hard work and careful study of the requirements of the physician and his patients. Unless you comply with these requirements, your pharmacy will always be an average drug store and the profession of pharmacy cannot number you among those who recognize the duty and responsibility of the profession.

It is true, in conducting a professional pharmacy, many specialties, such as Ampuls, Solutions, Stains, etc., put up by the various manufacturers, are sold on a close margin, but by rendering this service and making it possible for the physician to obtain them, he becomes familiar with your store, sends his prescription work there, and the volume of prescription business increases to the extent that it offsets

the loss in the sale of specialties many times. In other words, it is just a different form of advertising your business.

To-day more than ever before, we are trying to lead the drug store back to pharmacy.

A plate glass sign hanging over the prescription counter sets forth with admirable directness McKennan's merchandising policy:

PRESCRIPTIONS.

Purveyors to Physicians and their Patients only. We do not sell Patent Medicines, Tobaccos, Soda Water or Toilet Articles.

All Biologicals, Vaccines, Serums, Ferments, etc., are kept under Refrigeration—Ice Cooled.

Unless you are sick, we have not anything to sell you. That has been the store's message to the public for nineteen years.

This generous policy was Mr. Wolf's idea and it is standing the test of time. On October 23, 1930, the McKennan Pharmacy suffered a great loss by Mr. Wolf's death after a lingering illness of thirty months. The writer, who was taken in as an errand boy by Mr. Wolf, wishes to pay tribute to his memory. We are doing our utmost to "Carry On" the institution which his idealism so firmly established.

PROFESSIONAL AND COMMERCIAL PHARMACY.*

BY AQUILLA JACKSON.[1]

I suppose there is no more accurate way of describing the drug store than to refer to it as a professional-commercial institution. No matter how ethical it is or how extensive its professional service, there is always the commercial side to be considered. In other words, a sound business foundation must underly the store in all of its departments and branches.

I believe this conception of the drug store is sound and fully consistent with the high purpose it is to serve. The difficulty is, too many pharmacists have lost their sense of proportion and have sought to develop the drug store as a commercial institution only. This practice has been carried to shocking extremes. Every conceivable kind of merchandise has come into the drug store; it has become the subject of ridicule and criticism. This, to me, is simply a public interpretation—that the pharmacist is little short of a fool in his extreme commercial practices.

Several years ago, in fact early in 1930, the firm represented by the writer conceived the idea that it could render better pharmaceutical service by separating the business of the store into two divisions, one professional and confined to prescriptions, drugs and medicines and the closely and directly related side-lines, and the other, consisting of the soda fountain, cigar and candy departments, magazines, etc. Fortunately, we had plenty of space.

The large store room was divided by a partition reaching to the ceiling. At each end were archway openings, permitting free access from room to room. Two

* Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1934.

[1] Retail pharmacist, Baltimore, Md.

entrances from the street were provided, one leading directly to the professional pharmacy, and the other to the commercial room. This move, at first experimental, has turned out to be very satisfactory. We have had any number of favorable comments from physicians and the public.

From the beginning, our clientele seemed to feel that we had recognized a practical situation and had sought to meet it as best we could. Our problem was how to conduct a professional and commercial calling in the most satisfactory manner.

The advantages of our arrangement are many. For instance, a person seeking drugs and medicines, or desiring to have a prescription compounded, or to purchase some sick-room necessity can come to our professional division and be served by a competent pharmacist. There is no need to look around in an effort to ascertain who is the cigar clerk or the pharmacist. This thought, simple and trifling as it may appear, is really important. It emphasizes that the needs of the customer will be met by a competent pharmacist. Also the noise and distraction almost invariably associated, at certain hours of the day at any rate, with the soda fountain trade, is conveniently confined to a separate room. Young people, and older ones, too, come to the fountain, read, smoke and visit without interfering in any way with any other division of the store.

Even with this arrangement we have never thought that we could go the limit in commercial lines. We confine ourselves to the more or less traditional side-lines. After all, we are pharmacists, and we have tried to conform to professional standards, recognizing quite frankly that we had to deal with conditions as they actually exist.

I think pharmacists have made a tragic mistake in not recognizing the public interest in the drug store. In coming to this conclusion, I have noted more times than once that subconsciously, perhaps, but none the less definitely, people react adversely to too much commercial emphasis in a drug store. People seem to look upon certain phases of a drug store as something essential to them, something which means a great deal when sickness comes, and which they feel they can depend upon when required to do so. This is true to a much greater degree than we as pharmacists seem to appreciate. It is this same professional regard which people give to us that raises pharmacy to a professional plane. On many occasions I have heard people pay complimentary references to drug stores of a high type, and I have heard many, many adverse criticisms of the other kind that use pharmacy as a cloak for a high-powered commercial exploitation. Each reference springs from a high regard for pharmaceutical service and to a wide-spread public objection to associate it with a too flagrant commercial practice.

We have persistently refused to handle beverage intoxicants, and we have kept our store scrupulously free from slot machines of all kinds. While there may be many who do not object to such things in drug stores, it has been our experience that the greater part of the public are opposed to them. If we did not feel that they were objectionable, we would still exclude them from our store, as a matter of principle. We are selfish enough to believe that sooner or later the public will discriminate, and that what might appear to be profitable now may prove to be a decided loss later; there may be exceptions, due to peculiar geographical conditions, but generally speaking, I do think that some of us have gone too far.

Much has been said during the last few months with reference to open prescription counters. In my opinion and from expressions of others this is receiving much favorable comment; however, I would like to offer a few personal criticisms. *First*, is it consistent to bring before the public the vital part of our stores without taking into consideration the general appearance of our stores? In other words, can we expect to educate the public properly by continuing to handle the type of merchandise which really has no place in public health? *Second*, if the prescription counter is open and the pharmacist is in full view of the public, will it not be embarrassing on those occasions when a prescription is badly written (and very frequently they are) and you decide that it is necessary to contact the physician before filling the prescription? What impression will this make on the person watching you?

I am heartily in favor of educating the public along these lines; I think the open prescription department is a fine thing, but that it should be worked out in a practical way, taking many things into consideration.

In conclusion, I would like to tell you how I feel about the future of pharmacy. I shall begin by asking questions. *First*, are we necessary to public health? *Second*, how necessary are we? The answer to the first is obvious, the answer to the second question will decide about our future. As I see it, every single accomplishment in pharmacy in a legislative sense has been due to our efforts to bring the importance of its effect on public health before the lawmakers. It is the only thing that we have and can truthfully call our own. When the number of drug stores that are needed for public health service only (and I mean drug stores in every sense of the word) are functioning, it is then and then only that most of our problems will be solved.

DETERMINING COST.*

BY C. LEONARD O'CONNELL.

Recent developments in retail codes have focused the attention of the public and business men upon the problem of ascertaining the cost of the merchandise to the retail distributor. Strange as it may seem to competent and unbiased observers the approach to the entire problem is quite uneconomic. A careful consideration of the facts involved in the matter amply warrants this conclusion.

The New Deal, as it has happily or unhappily been designated by its champions, is ostensibly based upon what they choose to call a planned economy. In intent we were led to believe that the codes were designed to root out unfair practices. In their operation, particularly as they relate to the drug field, it begins to appear as if we are giving legislative sanction to and are perpetuating a system that is not only uneconomic but at the base is ethically unsound. An unprejudiced observer studying the facts at first hand might with all justice conclude that what we need in pharmacy in place of ineffective codes is just some old-fashioned honesty.

The orderly and economic flow of merchandise from its source to the ultimate consumer demands and should make use of the three agencies; that is, the manu-

* Section on Commercial Interests, A. PH. A., Washington meeting, 1934.

facturer, the wholesaler and the retailer. Until recent times this plan was the accepted mode of distribution. With the rapid increase of the modern merchandisers who based their appeal for patronage chiefly upon price appeal through deep cut rates upon standard commodities as "loss leaders" there grew the urge among the more aggressive to eliminate the wholesaler in order to garner for themselves this legitimate distribution cost.

This group of so-called direct buyers has increased to such a degree as to constitute a real problem when it comes to the point of determining the cost of merchandise. That is, we have different classes of ultimate distributors, from the standpoint of buying, whose basic costs radically differ. In consequence of this, an observer needs no great reasoning ability to see that any minimum price that equals or approximates the cost to small retail distributors affords a considerable margin to the group who can buy more advantageously.

Few small distributors seem to recognize that having a legal right to purvey something at the basic cost to them with the added privilege of paying for the opportunity of distributing such commodities is a pretty empty victory. It is certainly uneconomic to expect the ultimate distributor to defray the cost of retail distribution. To argue about the wide distribution and use of the commodity is beside the point, because unless the retailer is using such commodities as bait there can be no profit in such transactions, however considerable.

If the large unit distributors who prate about their more efficient methods of distribution were able to demonstrate their ability to get all the commodities they offer to the consumer at a great saving, there would be some merit to the argument that they can afford to distribute for less.

Contrary to this, however, it might be baldly stated that the plan in brief is to supply well-known merchandise at a price of cost or less with the overt intention of driving home in the public mind that all such merchandise is sold upon a similar basis which we know in practice is decidedly not so. This covert underselling plan is only successful to the extent that such distributors can sell "own brand" items at unusual profits to offset losses from standard underpriced articles.

Why have not those whose business it is to see that proper codes and fair practices in retailing be the order, approached the problem from an economic viewpoint and establish minimum prices that tend to conform to prices that might well come about in an honest and orderly economy? In other words the tendency of fair competition, even when highly aggressive, always tends toward the level of normal price, which price is the cost of the merchandise plus the expense of selling. In other words keen competition tends to reduce and finally to rule out net profits. In no case would fair competition go to the point of demanding the expense of retail distribution to be borne by the retailer himself.

The NRA was designed to afford more jobs and to increase wages. One might with justice ask how such a thing can come to pass unless the individuals operating the businesses at least get the cost of the item plus the amount required to sell it.

Original prices of $1, $0.50 and $0.25 come to have little standing in the minds of consumers who customarily have purchased such item at about 60% of the advertised price. In the final analysis an item is only worth what it will command in the open market, and if manufacturers have permitted their goods to be tossed

about steadily losing original value in the public mind, the burden for restoration is upon them rather than upon the small retailer.

Frankly, the matter is one easy of solution. If the majority of retailers would refuse to distribute items that do not carry their costs of distribution the problem would speedily be solved. Any item of unusual appeal has only gained this through the fact that the even flow of goods from manufacturer to consumer was maintained. Just as soon as a considerable number of the ultimate distributors do not afford their service in distribution much of this appeal will be speedily dissipated.

From any point of view neither the manufacturer nor the ultimate consumer should expect the dealer to pay for the cost of retail distribution. This cost should be borne by the consumer and would be gladly assumed by him if prices were properly set.

In other words, fairness and common sense would seem to argue that the ultimate consumer, while entitled to all the benefits of efficient distribution, certainly should be the one to pay for all the expense connected with the business of supplying him with his needs.

Briefly, the fair minimum price for any commodity should be the basic cost of the item plus the honest efficient cost of selling. Certainly most people would agree that any retail drug business no matter how efficiently operated, would require not less than 20% of the sales for expenses.

Upon this basis the minimum resale price of any item is easily computed. If an item costs $4 per dozen it would be sold for $5 per dozen or $0.42 per unit which price would absorb the 20% overhead or cost of doing business. In the case of $8 per dozen it would sell for $10 a dozen or $0.83 per unit. In a similar manner it could be extended to all classes of rapidly selling advertised merchandise. Such a plan would not interfere with the volume sale of any product and would be an economic procedure in that all factors engaged in the distributive scheme would be assured compensation for the actual service rendered.

In conclusion might it not be well again to remind the small retailer that such a plan will come about only to the extent that the manufacturers feel that the small retailers are earnest in their opposition to the perpetuation of a scheme that is not only ethically unsound but is also economically indefensible.

WILLIAM LONGSHAW, JR.,* NAVAL SURGEON AND PHARMACIST, A HERO OF THE CIVIL WAR.

BY LOUIS H. RODDIS.[1]

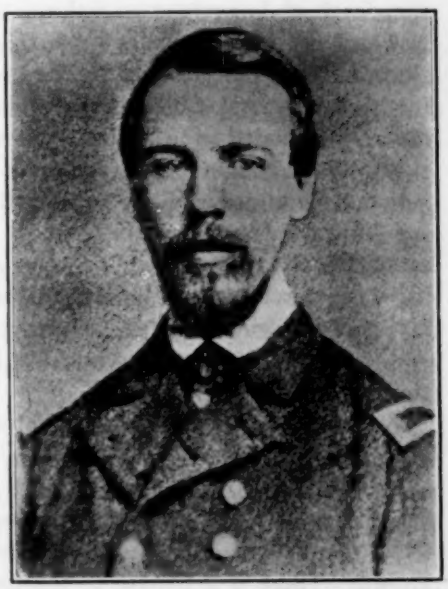
This sketch is an attempt to bring to your attention a former member of the AMERICAN PHARMACEUTICAL ASSOCIATION, who is one of the forgotten heroes of the Civil War. When serving as an assistant surgeon in the Navy on the U.S.S. LEHIGH he showed outstanding courage and devotion to duty in an engagement with Confederate batteries on Sullivan's Island on November 16, 1863. Under the

* Section on Historical Pharmacy, Washington meeting, 1934.

[1] Commander, Medical Corps, United States Navy.

fire of nine batteries in which the LEHIGH was struck 22 times, it was necessary to pass a hawser to the U.S.S. NAHANT which had grounded. The lines from the first two hawsers were carried by Longshaw in a boat manned by gunner's mate George W. Leland and coxswain Thomas Irving. Twice the hawser was shot away. The LEHIGH was eventually floated and saved. His gallantry on this occasion received official recognition. The commanding officer of the LEHIGH in his report of the action says: "I would especially mention the valuable service voluntarily rendered by Assistant Surgeon Longshaw."

The officer commanding the South Atlantic Blockading Squadron, Rear Admiral Dahlgren, in his report to the Navy Department states that: "Twice he passed in a small boat from the LEHIGH to the NAHANT carrying a line bent on the hawser. The shot and shell from cannons and mortars were flying and breaking all around." The Admiral gave appointments as acting master's mates to the two petty officers who rowed Doctor Longshaw on this perilous duty; recommended Longshaw to the notice of the Department as having risked his life as a volunteer in order to save a valuable vessel; and issued a general order commending the officers and men who took a prominent part in the saving of the NAHANT, directing it "to be read on every quarterdeck of the fleet at the next general muster after its reception."



WILLIAM LONGSHAW, JR.

The Secretary of the Navy, Mr. Gideon Wells, acknowledged Longshaw's conduct with a letter of commendation which was made the subject of another general order by Admiral Dahlgren to be read on the quarterdeck at muster so that in the words of Longshaw's biographer, the late Medical Director Gatewood, "the gallant conduct of Doctor Longshaw... was published twice on the quarterdecks of perhaps 60 vessels of the Navy."

Now what should interest us particularly about this brave young man was that prior to studying medicine he was a practical pharmacist. Furthermore, while studying medicine at the University of Louisiana he worked as a drug clerk at Bayou Lara for 12 months. He obtained his medical degree at the University of Michigan in 1859, with a special diploma in chemistry and pharmacy. Doctor Gatewood alleges that he became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION.[1] In other words, he was a member of our own ASSOCIATION.

Longshaw showed himself a hero at the engagement with the batteries on Sullivan's Island. He showed himself again a hero in his death at the assault on

[1] ASSOCIATION records show that William Longshaw became a member in 1858.—*Editor.*

Fort Fisher on June 15, 1865.[1] The report by the officer commanding the landing party from the MINNESOTA states: "Assistant Surgeon William Longshaw, Jr., after adding to the reputation for bravery which he gained under fire of the batteries at Charleston while serving on board the iron-clad LEHIGH, was shot by the enemy as he was binding up the wounds of a dying man. Their dead bodies were found lying side by side the next morning." The fleet captain, K. R. Breese, in his report states: "Of Assistant Surgeon William Longshaw special mention should be made on account of his great bravery and attention to the wounded under the hottest fire, until finally he fell a victim in the very act of binding up the wounds of a marine."

A distinguished eye-witness, Rear Admiral Thomas O. Selfridge, in his account of the attack on Fort Fisher in "Battles and Leaders of the Civil War," describes the death of Longshaw as follows: "While kept under the walls of the fort, I was an eye-witness to an act of heroism on the part of Asst. Surgeon William Longshaw, a young officer of the medical staff, whose memory should ever be kept green by his corps, and which deserves more than this passing notice. A sailor, too severely wounded to help himself, had fallen close to the water's edge and with the rising tide would have drowned. Dr. Longshaw, at the peril of his life, went to his assistance and dragged him beyond the incoming tide. At this moment he heard a cry from a wounded marine, one of a small group who behind a little hillock of sand close to the parapet, kept up a fire upon the enemy. Longshaw ran to his assistance and while attending to his wounds was shot dead. What made the action of this young officer even more heroic was the fact that on that very day he had received a leave of absence, but had postponed his departure to volunteer for the assault."

I draw your attention to that phrase of Admiral Selfridge's—"*Whose memory should ever be kept green by his corps.*" As he was, too, a member of the AMERICAN PHARMACEUTICAL ASSOCIATION, I am glad to make him known to-day at a meeting of the ASSOCIATION that it, too, may honor his memory.

Robert Louis Stevenson's famous eulogy of the medical profession is well known. There is a tribute to the military surgeon which should be equally well known. It was written by one of the most brilliant men of our generation in a forgotten book about a forgotten war. It is a peculiarly fitting tribute to repeat in connection with the death of this heroic naval surgeon and pharmacist: "The profession of medicine and surgery must always rank as the most noble that men can adopt. The spectacle of a doctor in action among soldiers, in equal danger and with equal courage, saving life where all others are taking it, allaying pain where all others are causing it, is one which must always seem glorious, whether to God or man. It is impossible to imagine any situation from which a human being might better leave this world, and embark on the hazards of the Unknown."

President Roosevelt participated in the ceremonies in which the American Legion presented to the brothers, Dr. William J. Mayo and Dr. Charles H. Mayo, citations voted at the last national convention, honoring them for their humanitarian services. Dr. Charles H. Mayo is honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION.

[1] PROCEEDINGS, A. PH. A., for 1865, concur and give his age as 28 years.

DETAILING FOR PRESCRIPTIONS.*

BY FRANK B. KIRBY.

Generally speaking the first consideration in developing a prescription pharmacy is a realignment of the internal arrangement of the store. It is easily recognized that there is a rapidly growing sharp line of demarcation between the merchandising or commercial drug store and the professional pharmacy. There is no question that the ordinary luncheon counter has no place in the latter although the professional pharmacy in a Medical Arts Building might render an acceptable and approved service to the doctors of the building if they catered to a light lunch only.

However, to put a real meaning back of the sign "Prescriptions a Specialty" such a store must not be satisfied with eight per cent floor space for prescriptions and twenty-five or more per cent floor space for lunches.

If we are to aim for a basis of prescription returns at least fifty per cent of the total income, then we must actually specialize in as many ways as possible. We must bring the prescription department to the front, if not literally then potentially. The swinging doors with the signs "keep out" and "no admittance" must be removed. The department itself must show a rigid regard for cleanliness. This done, you can consider the desirability of the open display prescription department. Remove a section of the separating partition or show case. Replace it with a glass partition or leave it open. In fact we might even consider actually bringing your prescription department to the front so it will at least partly occupy the front window. What better advertising appeal can you offer the transient public! Our bid for favorable attention is two-sided—one to the professional men who will write prescriptions to be sent to our store; the other is the public for whom these prescriptions are written. To turn prospects to customers we must first find, then sell the prospects. We aim to turn the window shopper to an active customer. Consider then the open display prescription department and its desirability in the window.

A studied plan of window displays is very good advertising. It is not enough to coöperate with the splendid idea of Pharmacy Week. Why not consider one week per month, rather than one week a year, always with a tie-up in the store on the show-cases.

Of course our new program considers the elimination of questionable store practices. Your patrons may shop for prices but don't you shop for business. Name your price and hold to it. Counter prescribing is of course absolutely taboo.

Carry enough stock to have a workable assortment. Put in a library of suitable pharmaceutical reference books and include books on materia medica and applied therapeutics and some trade and medical journals to encourage reference by your doctors.

Now you have the atmosphere into which you can invite any doctor or customer. Without this background your professional contacts will fall flat. Now you can really qualify as a prescription specialist. The next move is to determine your

* Section on Commercial Interests, A. PH. A., Washington meeting, 1934.

operative area. You decide just how much territory you intend to cover, using your store as a center.

You then make a card index of every last prospect in that area. Your first call will eliminate many of them as undesirable. Your object is an active call list of the cream of the entire list. This card index will carry the accurate spelling of the name, address and hospital connection of every prospect. It will show the office hours, day-off and specialty practiced and allow for columns to indicate the dates of calls and repeat calls, with enough space to record notes of interest, product detailed, whether sample or circular was left and most of it in code so that if lost or stolen the cards will represent little if any value to the finder.

Now comes the problem of time-finding. We are considering nothing but the personal call as having many times the business building value of letters or phone calls.

It is easily agreed that while we pay salaries by the week we are actually getting more value per dollar of salary in the busy hours than the quiet hours. We pay the same for the peak load hour as for the valley performance. The object is to raise the valley hour values. Therefore, we spot those hours and adjust them to the office hours of our prospects as shown by our card index. One can easily reach any doctor within five blocks of the store in five minutes. Allowing twenty minutes for the interview, that permits of two professional contacts per hour. Suppose you have only one hour per day, the question arises as to repeat calls. Subject to variations, two months is too distant and one month too frequent. Assuming that six weeks is reasonable for repeats, and using only five days a week, you are thereby easily scheduled for sixty doctors every six weeks. This is just about sixty more than are regularly contacted right now. If your call list, after weeding out the undesirables, is thirty or ninety, it is easy to adjust your schedule.

Our next problem is what to detail. First we would mention your own name goods; a formula of your own, either complete and perfected, or incomplete, as for instance a vehicle or cough-syrup base, ointment base or some such product as a tooth paste base. This suggests the growing value of the dental profession and the desirability of including the dentists in your operative area for your card index record. One advantage in calling on dentists is the fact of all-day office hours as compared with the relatively few hours available for physicians. Also one must recognize that dental colleges are not teaching prescription writing, neither the science thereof nor the economic principles involved.

Getting back to the subject of what products to detail we would first caution against talking about too many products. Four or five are too many. Remember the twenty-minute limit to guarantee a welcome on your next call and you had better stick to one product. Do not be too scientific; your doctor is a practical man and wants facts. He wants to know the name of the product, its uses, indications, solubility, toxicity (if any), dosage and contraindications. Omit the chemical structure and pharmaceutical details.

Pick your additional products from the U. S. P. and the N. F., also the N. N. R. and the R. B. of the AMERICAN PHARMACEUTICAL ASSOCIATION. These will give you all the material you will ever want considering one product (or even two) per call and eight calls per year.

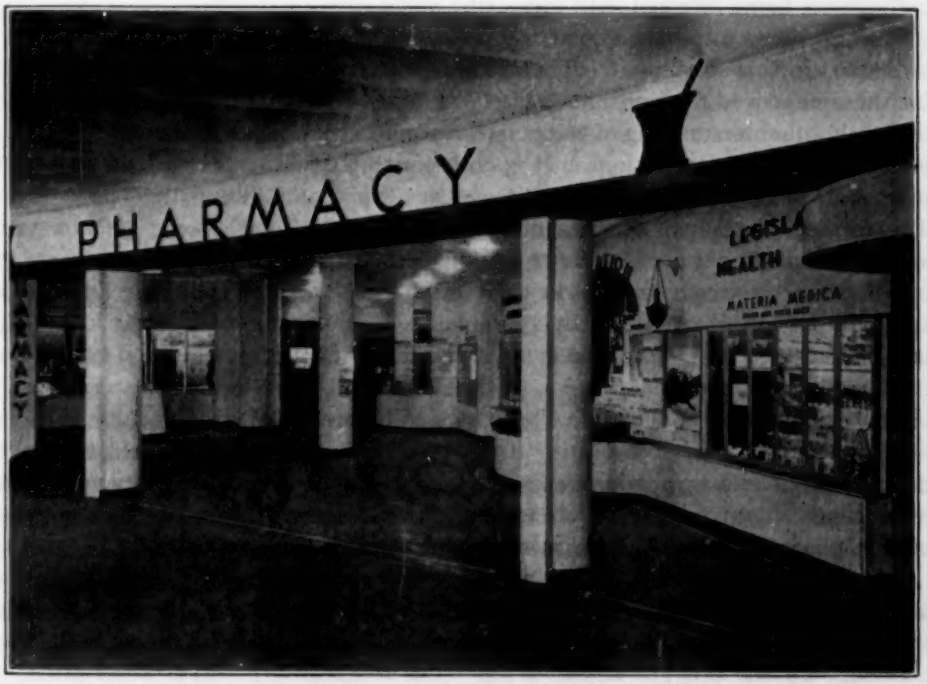
A word on team-work with the detail men of the many manufacturing phar-

maceutical houses. They are here to stay and their acquaintance had better be cultivated. They are asking you to fill the prescriptions they create. You should expect them to coöperate with you. They should give you the same presentation they give their doctors and a full list of all doctors detailed in your operative area. Then, if you follow up on that list by personal call you are in line for twice the returns from half the effort—half your time expense. Let those doctors know that you have that particular product in stock and want his prescriptions.

Here is an idea that might be tried. Go through the advertising in the medical journal either national or state most widely read by your doctors. Pick out the products you have in stock and use them for a professional window display. Use a sign calling attention to the name and date of the journal used. Tell your doctors about your window.

Finally the "thank you" letter. Go through your files and list the doctors whose prescriptions you have filled in the last month. Send them a letter of thanks and a request for more or continued business. Vary the wording but systematically capitalize on the idea as you systematically work your call list.

We are confident that based on the principles of action above outlined any professionally minded pharmacist can put on an effective business building program that will pay good dividends in continued good business.



General view of the pharmaceutical exhibit, World's Fair, Chicago.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Editor's Note: With the placing of pharmacy upon a collegiate basis the pharmacist is in position to meet professional men on their own ground. Pharmacy and medicine must work hand in hand if the public health is to be conserved, and such coöperation cannot be secured or maintained unless the pharmacist is willing to meet the physician on a professional basis and discuss their mutual problems. In fact, it seems to me that it is incumbent upon the pharmacist to cultivate the acquaintance of the physicians whose prescriptions he is compounding, and to discuss with them any difficulty involved. The following paper by Dr. L. Wait Rising contains good ideas on how to teach students to approach physicians. If the student has the proper professional attitude, the proper cultural background, the necessary self-confidence, and the natural desire to coöperate with his physicians, it would seem, at least to your Editor, that he would be able to make the proper approach without being taught any special methods. I agree with Professor Rising that every student should be thoroughly awake to the importance of this professional contact and coöperation.—C. B. JORDAN, *Editor*.

TEACHING STUDENTS HOW TO APPROACH PHYSICIANS.

BY L. WAIT RISING.

Pharmacy is to-day making its greatest bid for the friendship and coöperation of the medical profession. Better professional relationships between the two callings are being stressed with increasing vigor.

The colleges of pharmacy are turned to as organizations which should have a large part in this movement. Their task is primarily to equip the men responsible for these improved relationships, not only with a thorough knowledge of pharmacy but with an understanding of the personal equation problems incident to the interlocking of the two professions. It is not enough that our schools should graduate men and women who, to use a not too elegant expression, "know their pharmacy." The mere possession of fundamental pharmaceutical knowledges does not grant any special ability to use that information advantageously in contacts with medical men. Since these contacts are keystones in the structure of improved relationships, the value of any effort made by the colleges to aid in unlocking this knowledge and making easier its expression is obvious. It is just as necessary and essential to train men in the verbal expression of their skill as it is to develop dexterity in the laboratory. A few students have been blessed by nature with the faculty of logical exposition, so that after acquiring a thorough knowledge of their field they need no training in oral expression or human relations to enable them to tactfully and intelligently contact medical colleagues. But the mass of students stand in need of at least some direction in the art of making the right sort of professional contacts.

Our colleges must not fail in their increased responsibility to the profession by neglecting this added phase of instruction at a time when it is most needed. That they have not measured up in the past is evidenced by the fact that when it becomes necessary for the druggist to call a physician about an error in a prescription, he all too frequently makes a hasty grab for the telephone and shouts into the doctor's ear, "You made a mistake in Mrs. Brown's prescription. What shall I do about it?" Or when he resolves to do some detailing he finds on entering the physician's

office that he does not know how to say what is on his mind. The result is a lame and somewhat stereotyped "Doctor, we specialize in prescriptions. Only the best ingredients are used. We will call for prescriptions and deliver medicines promptly. Come down and look over our prescription department. Good-bye." These conversations are perhaps a trifle overdrawn, but they serve to illustrate the definite inability of the average pharmacist to express himself orally under certain circumstances. He feels this deficiency, loses confidence in his ability to cope with such situations and builds up an inferiority complex with respect to all medical men.

Some of our schools are making determined efforts to instruct the student in the art of verbal professional relations with the hope of eradicating this condition, but the movement is not sufficiently widespread to do a great amount of good. It is the purpose of this paper, therefore, to once again call attention to this lack of ability on the part of our pharmacists and to the concomitant lack of initiative on the part of the schools of pharmacy in remedying the condition.

Let us consider what might be done by the colleges to make telephone conversations a normal part of pharmaceutical technique. They should be studied just as are any other subjects with which the student is not familiar. The professor of dispensing pharmacy should handle this work and he might well begin it with a detailed analysis of professional calls. By so doing he could satisfactorily impress his students with certain salient facts about this type of contact which, if thoroughly comprehended, would go a long way toward preventing misunderstandings between physicians and pharmacists.

Let the analysis start with a consideration of the reason for the call. The student probably already knows that in the majority of cases where the pharmacist finds it necessary to call a physician, the reason centers in that physician's prescription. What he probably does not know, or at least does not fully realize, is that this call is basically a criticism of the physician, and further that, no matter how merited, unless diplomatically and tactfully stated it will not be pleasantly received. If the approach is wrong, the writer of the prescription infers that he is somehow being placed on the defensive, and he immediately rises to the occasion with a typical defensive mental attitude, a sort of "I'll show you who is right" feeling. Considerable palliative explanation then becomes necessary if the conversation is to accomplish the desired result.

The professor can well point out here the serious consequences frequently resulting from a few colloquies bungled for this reason. After a conversation has taken the trend indicated above, the physician's response is often such as to make the pharmacist feel that he is the one who is in the wrong and that he is unjustly being made the target for caustic comment. Therefore many pharmacists prefer to guess at the intent of the prescriber or to alter the prescription in a fashion far beyond their authority rather than run the risk of another unpleasant encounter with the doctor. Such procedure is manifestly unfair to the patient and the physician, and is a very poor advertisement for pharmacy. The student is thus made aware through this method of approach that each occasion for calling a physician regarding a prescription is usually a necessary criticism, that unless properly introduced the criticism antagonizes, and that this antagonism frequently results in subsequent unethical handling of prescriptions.

Now is the time to stress a revision of the proverb, "A soft answer turneth away wrath," which changed might read, "A soft suggestion bringeth ready acquiescence." In other words, a nicely turned, discriminating opening of the conversation will avoid all misunderstandings, will put the doctor in a receptive frame of mind, and will pave the way for a mutually agreeable conclusion to the affair.

One of the major contributors to this satisfactory opening is a complete understanding of the point or points of difficulty in the prescription. The vital necessity of being thoroughly sure of his ground before making any attempt to call the physician should be explained to the student. There are certainly enough parallels that can be drawn from the daily recitation problems of a student to quickly convince him that knowledge brings confidence and confidence brings ease of mind with its consequent sureness of expression.

In order to satisfactorily develop the opening statements and to facilitate the planning of the subsequent technical portion of the conversation, the student should be taught to ask himself the following questions. All difficulties as far as an intelligent, well-spoken explanation of the topic of conversation is concerned normally will have vanished as the direct result.

The first question is: Precisely why is it necessary to call the doctor? This gets the difficulty so clearly fixed in the mind that explaining it becomes easy. The diagnosis made, a treatment is indicated; hence Question two: What means are available for remedying the condition? The answer to this question not only sets forth the possible solutions of the difficulty but should also suggest which will be the most suitable. Question three: Are the reasons for the suggestions to be made to the doctor valid, and can they be stated in a few words? The first part of Question three is a check on those who are prone to jump at conclusions. Such people need something that will make them pause and reflect. Many times what seems to be the obvious chemical or physical trouble in a prescription is in nowise responsible. An examination into the validity of the arguments would avoid such error in judgment. The last half of Question three is to prevent rambling after the conversation has begun. For obvious reasons, the physician appreciates a simple, concise statement of the difficulty and its solution. Question four: Precisely what is the opening statement to be? This is perhaps where the greatest amount of tact is required, for the opening statement creates the first impression. The value of that impression in gaining the respect and the willing coöperation of the physician has already been seen.

Basically the same preparation is required for personal visitation work or other types of physician-pharmacist conversations in which the latter is endeavoring to enlist the aid and coöperation of the former. The questions suggested point always to the fundamental structure of any interview of a professional nature. They focus the proper attention on the objective, the building up of the case, and the fashion in which it will be executed. The result is a well-planned interview, a rarity to-day. Physicians cannot help reacting favorably to this new thoughtfulness on the part of the pharmacist. Surely this reaction will indicate that the colleges are more than ever living up to their obligations to pharmacy.

THE CONFERENCE OF PHARMACEUTICAL ASSOCIATION SECRETARIES.

ABSTRACT OF THE MINUTES OF THE SESSIONS HELD IN WASHINGTON, D. C., WEDNESDAY, MAY 9TH, THURSDAY, MAY 10TH, AND FRIDAY, MAY 11TH.

The First Session of the Conference of Pharmaceutical Association Secretaries was convened May 9th, at 2:00 P.M., by President Robert C. Wilson. The following responded to roll call: W. E. Bingham, Alabama; Charles Clayton, Colorado; Albert Dougherty, Delaware; Robert Wilson, Georgia; William B. Day, Illinois; F. V. McCullough, Indiana; J. W. Slocum, Iowa; John F. McCloskey, Louisiana; Roy C. Reese, Kansas; Prescott Loveland, New Jersey; George Mathers, New York; J. B. Pilchard, Pennsylvania; James J. Gill, Rhode Island; J. M. Plaxco, South Carolina; Walter Adams, Texas; A. L. I. Winne, Virginia; J. Lester Hayman, West Virginia; Ralph W. Clark, Wisconsin.

The members were requested to stand in silence in memory of Edgar D. Oslin, of Arkansas. Due to the absence of Secretary-Treasurer Carl G. A. Harring, Roy C. Reese was elected temporary Secretary. The report of Secretary-Treasurer Carl G. A. Harring was read and accepted with thanks. It follows:

REPORT OF THE SECRETARY.

BY CARL G. A. HARRING.

Fellow Secretaries:

The pleasant task of maintaining contact between the members of our Guild has been mine for another year, and although the responses to my efforts have not, at times, been as enthusiastic as I had hoped they might be, the fact remains that we are still acting in unison and with more interest than previously. At our last conference in Madison, I was charged with the duty of preparing and mailing questionnaires upon topics of the day, every quarter—this duty I have tried to fulfil but owing to the fact that the time between meetings has been contracted by three months, only two questionnaires were sent out. The replies to these questionnaires were not as numerous as your secretary had dared to hope; while questions of vital importance were discussed, the universal interest that we had hoped to create was still missing.

If we could lay down a course of action to be followed by all secretaries, if we could induce each and every one of them to participate in this work, and impress upon our state associations that this work is going forward and must be the rallying point for those who have the good of pharmacy at heart, then we would be doing something, and starting the ball rolling in the right direction. Too many secretaries are so occupied with their own affairs that the affairs of the state association must suffer, hence, when national associations endeavor to organize some concerted movement they are handicapped by the lack of practical working contacts.

If every state association had a competent individual as its secretary and paid him a salary that would allow him to give all his time to the association and, if these secretaries as part of their duty were to keep in contact by short monthly bulletins, I feel certain that pharmacy would benefit to an amazing extent. It is my sincere hope that during the coming season the questionnaire or bulletin system will voluntarily enlarge, even at the sacrifice of some time on the part of secretaries, and that *your* secretary will be kept busy answering questions.

The exchange of Pharmaceutical Journals has been of great practical value and your secretary wishes to extend his thanks to those secretaries who are thoughtful enough to send him every number of their publication.

It is indeed unfortunate that many secretaries do not find it worth while to affiliate with our Conference. Your secretary has taken pains to send all communications to every secretary in the United States, and would have appreciated the courtesy of an acknowledgment. It is my firm belief that where a secretary is indifferent to a movement such as this conference, there you will find a state association that shows spasmodic signs of life, but accomplishes very little in the long run.

Your secretary would recommend that the questionnaire and bulletin system be continued, in the hope that more interest will be evinced and that more of a spirit of coöperation may be developed. There can be no question but that the conference plan is sound—it is up to us as individuals to make it an outstanding success.

REPORT OF THE TREASURER.

BY CARL G. A. HARRING.

Jan. 1, 1933, on hand	$359.46	Jan. 15th, Printing minutes	$ 10.66
Received dues from 30 members	150.00	Envelopes and stamps	3.96
	$509.46	Mimeographing	3.00
Less expenditures	277.57	Mailing	1.65
Cash on hand, Dec. 31, 1933	$231.89	June 1st, Mimeographing	1.50
		Stamps	2.00
		June 20th, Mimeographing	1.75
		Mailing	1.50
		July 5th, Mimeographing	4.50
		Stamps	1.50
		Aug. 16th, Mimeographing	3.00
		Aug. 24th, Mimeographing	4.75
		Sept. 15th, Mimeographing	2.25
		Stamps	2.00
		Donation to Century of Progress	50.00
		Donation to American Institute of Pharmacy	100.00
		Honorarium to Secretary	50.00
		Oct. 15th, Jour. A. Ph. A.	25.00
		Nov. 1st, Stamps	3.30
		Dec. 10th, Mimeographing	1.75
		Stamps	1.50
		Dec. 30th, Mimeographing and Mailing	2.00
			$277.57

During 1934, 18 members have paid dues amounting to $90 and about $21 have been expended, which would leave on hand at this time $300.

The address of President Robert C. Wilson was read. It follows:

ABSTRACT OF THE REPORT OF THE CHAIRMAN.

BY R. C. WILSON.

Fellow Secretaries:

I do not propose to burden you with an extensive address but am using this opportunity simply for a few remarks on some matters in which we are vitally interested. I will not attempt a review of the various matters which have transpired during the year, but on the other hand while certain of these events are fresh in our minds I want to discuss one or two of them with you, which may have to do with our future welfare.

1. I believe that this Conference should be enlarged in so far as membership is concerned to include all other officers in addition to the secretaries; thus, by opening up the membership in this way would be very helpful by increasing the number attending this group and tend to bring together in a more general way the leaders in pharmacy throughout America, and would stimulate a much broader interest in the work of this Conference.

I, therefore, recommend for your consideration and action, if you deem advisable, that the name of this Conference be changed to read, "The Conference of State Pharmaceutical Association Officers," and include elected or appointed officials of any or all of our State and Territorial associations.

2. American Pharmacy, as I see it, has been subject to many calls within the past and sensing that a crisis confronted us, or we thought it did, we have responded or attempted to respond to each of these calls, many of which were leading in diverse directions and getting us nowhere. Events of the recent past should impress upon us the importance of being able to present a united front, particularly in so far as our national objectives are concerned. We should be subject to one call, which should be promulgated by a properly constituted authority with the ability for real leadership.

I would not deny to the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Retail Druggists, the Drug Institute and the National Drug Trade Conference the right to existence so long as their primary objective is for the welfare of pharmacy in America. I do feel that if these organizations had given more attention to our State pharmaceutical associations, that their own work might have proven more worth while and our own State association's work would have been cemented one with another on a much firmer basis.

We are not only subject to calls from these national organizations but also from various minor groups as well as individuals who, independent of all other groups, are also seeking to establish themselves as leaders. This is not as it should be. Unless and until some sort of a plan for the unification and centralization of our efforts and objectives is found, American Pharmacy will continue to flounder as in the past; present conditions are the result.

We have seen our State associations ignored at times by our National associations; they come into our States for organization purposes, frequently without our knowledge or consent, seeking to build up their own organizations without due regard to or consideration for our State associations.

Lastly, we have seen the organization of District Drug Code Councils without any regard whatever for or relationship to the State associations. What comes next we cannot tell, but unless and until this matter of the invasion of the individual states by any and every organization which may come along, intent upon ignoring the existence of our State associations, is controlled in some way, then there will be no place for our state organizations.

I would, therefore, recommend that this Conference adopt some resolution covering the points I have just discussed with the idea of insuring some definite restraint against the possibility of future ignoring of our State pharmaceutical set-ups.

The address of the President was received and discussion deferred to the Second Session of the Conference; and a committee was appointed to present a report on the address at the Second Session.

After further discussion William B. Day moved to extend invitations to State associations to be represented by all their officers, or as many as could attend. F. V. McCullough moved that the recommendations of President Wilson be considered following the Joint Session with the Section on Education and Legislation. It was so ordered.

J. J. Gill reported the illness of Secretary Harring and on motion a telegram was sent to him, expressing sympathy and the hope for his early recovery.

Walter D. Adams moved that a committee be appointed to draft resolutions and spread them on the minutes on the death of Edgar D. Oslin and that a copy of the resolutions be sent to his widow. It was so ordered.

President Wilson read a telegram of greetings from Secretary Elbert R. Weaver of Oklahoma Pharmaceutical Association.

Prescott R. Loveland moved that an honorarium of fifty dollars be paid Secretary Harring and that the Secretary-Treasurer be authorized to draw a check to that amount payable to himself—carried unanimously.

The list of topics for discussion were read. It follows:

(Instead of repeating the subjects they will be hereafter referred to by number.)

1. "Is it desirable, if so, is it possible to form a National Association from the various State Associations with every member of the State Association automatically a member of the National Association without payment of additional membership dues?"

Discussion opened by A. L. I. Winne, Secretary, Virginia Pharmaceutical Association.

2. "Is a State Drug Code desirable in addition to the National Code?"

Discussion opened by Prescott R. Loveland, Secretary, N. J. Pharmaceutical Association.

3. "Since the State Associations have been ignored in the National Drug Code set-up, what should be the attitude of the State Associations to Code matters?"

Discussion opened by J. Lester Hayman, Secretary, West Virginia Pharmaceutical Association.

4. "Can a plan be evolved whereby one membership fee can be made to cover State and National Association dues?"

Discussion opened by R. A. Turrel, Secretary, Michigan State Pharmaceutical Association.

5. "The organization of Congressional Districts or County Units."

Discussion opened by J. W. Slocum, Secretary, Iowa Pharmaceutical Association.

6. "Is the handling of liquor in drug stores under prohibition repeal on a satisfactory basis? What changes or improvements should be made?"

Discussion opened by F. V. McCullough, Secretary, Indiana Pharmaceutical Association.

7. "Is it desirable, if so, is it possible to have this Conference submit to each State association each year some suggestions as to the program with the idea of unifying our efforts toward some definitive objectives, National in scope?"

Discussion opened by W. D. Adams, Secretary, Texas Pharmaceutical Association.

8. "Is there a desirability and a possibility of holding joint meetings of the Pharmaceutical Associations with the State Medical and Dental Associations?"

Discussion opened by E. F. Kelly, Secretary, Maryland Pharmaceutical Association.

9. "What steps can be taken through Association channels to curb the practise of manufacturers packaging 10¢ sizes of proprietary medicines and cosmetics for distribution through department stores?"

Discussion opened by Roy C. Reese, Secretary, Kansas Pharmaceutical Association.

10. "To what extent can the professional phases of Pharmacy be made a part of our programs?"

Discussion opened by J. G. Beard, Secretary, North Carolina Pharmaceutical Association.

Editor Eberle extended greetings and offered to do whatever he could to help the cause of the Conference.

On motion duly seconded the reports of the Secretary and of the Treasurer were accepted with thanks of the Conference.

President Wilson stated that the topics for discussion would be taken up. A. L. I. Winne presented Topic No. 1.

Discussion was opened by A. L. I. Winne on the program item entitled, "Is it desirable, if so, is it possible to form a National Association from the various State Associations with every member of the State Association automatically a member of the National Association without payment of additional membership dues?" Mr. Winne reviewed the circumstances which prompted the inclusion of this item on the Conference program, referring to an editorial appearing in the January *Virginia Pharmacist*, and discussed the proposition briefly, presenting the seeming advantages that might accrue from a federation of State Association members and at the same time pointing out the disadvantages and the possible conflict with the several existing national organizations.

The chairman then opened the topic for discussion and views were expressed by a number of those present. There was naturally a division of opinion and while a considerable number of the secretaries present thought that the plan might be successfully carried out others objected on the grounds of the difficulties to be encountered in the formation of another national organization, and of the possibility of a division of strength rather than the promotion of unity, and of the weakening effects which such an organization might have upon the already existing nation-wide associations. Those taking part in the discussion were Secretary Reese of Kansas, Secretary Adams of Texas, Secretary Wilson of Georgia, Secretary Clark of Wisconsin, Secretary McCullough of Indiana, Secretary Loveland of New Jersey, Secretary Pilchard of Pennsylvania, Secretary Slocum of Iowa, Secretary Plaxco of South Carolina, Secretary Day of Illinois, Secretary Mather of New York, Secretary Hayman of West Virginia and Mr. Riemenschneider of Chicago.

The discussion did not lead to any formal action but the incoming president was authorized to appoint a committee to give it further study and to empower this committee, under the direction of the President, to call a special meeting of the secretaries of the several state associations, at a place to be designated, to formulate plans and effect an organization, if deemed advisable.

This committee was also authorized to bring to the attention of each state association secretary the outline of the plan and to request that it be presented at the impending annual meeting of each state association for discussion, and for such action as the association desired to take with reference to the proposition. (Abstracted by A. L. I. Winne.)

Secretary E. F. Kelly expressed appreciation of the AMERICAN PHARMACEUTICAL ASSOCIATION for the work being done by the Conference and hoped that the relationship with State associations would be closer, for he believed firmly in the value of their coöperation. These bodies should meet several times a year and hold longer sessions and for this purpose the American

Institute of Pharmacy presents the opportunity and the ASSOCIATION hopes that these bodies will be one of the strong units of the Headquarters project. In Maryland there is a close coöperation of pharmacists with the medical and dental professions.

Prescott Loveland referred to the coöperation of the medical, dental and pharmaceutical professions and other related organizations in New Jersey.

Roy C. Reese referred to these bodies in Kansas with the Public Health Council.

President Wilson stated that in Georgia two pharmacists had been named on the State Board of Health.

Prescott Loveland introduced Topic No. 2. He said: In opening this discussion, I will state that the week before last, the pharmacists of New Jersey succeeded in getting a State Retail Drug Code. The primary reason for desiring a State Code was because the Code Authorities under the Federal set-up seemed unable to get action on code violations within a reasonable time.

Several months ago there was formed in the New Jersey Pharmaceutical Association the Retail Drug Trade Alliance, a wheel within a wheel. Dr. Fischelis was the Chairman of the Alliance. This newly formed body in coöperation with local and county organizations, proceeded to prepare a State Retail Drug Code similar to the National Code, which, under a law passed and signed by Governor Moore in July of last year, made it possible for a majority of any industry applying for a code to obtain the approval of the Governor for one subject.

The services of a lawyer were obtained and Dr. Fischelis of the Retail Drug Trade Alliance and representatives from the other organizations, patterned a Code of Fair Competition for the Retail Drug Trade of the State of New Jersey. A public hearing was called in Newark on April 17th. A capacity crowd filled the largest room available in the Industrial Building. Deputy State Administrator Tepper was in charge of the meeting and called for statements from proponents and opponents of the code. Dr. Fischelis led off for the proponents, presenting the matter in a very comprehensive way. He was followed by several other speakers.

The opposition was represented by a woman attorney from New York. She stated that her clients bitterly opposed the 21% mark-up. In response to a question by the Deputy Administrator, she stated that no such mark-up was necessary. On being asked who her clients were, she refused to name them, but on Administrator Tepper's statement that he would expunge her remarks from the record, she stated that she would advise him privately who her clients were.

The representative of the owners of a chain of cosmetic shops also opposed the 21% mark-up. He stated that his firm was making money at the present time and did not need any such mark-up. A little cross-questioning by the Deputy Administrator showed the weakness of his argument.

One other opponent was heard, an officer of a department store, who said that his firm was not opposed to the code but was afraid that a 21% mark-up in Newark and Jersey City would drive a lot of business across the river to New York City where no such mark-up was in operation. Administrator Tepper's reply to this was "If New York business men want to do business at starvation prices, I don't see why New Jersey merchants should be compelled to do so."

At the conclusion of this hearing, we were lead to believe that except for some minor changes the code would receive favorable consideration, so that several days later, Dr. Fischelis and the other members of the Committee were quite amazed on learning from the State Administrator that the code would be allowed to go through, but with the mark-up eliminated. At a meeting of the Board of Trustees of the New Jersey Pharmaceutical Association, the members of the Board were unanimously in favor of notifying the authorities that we did not desire a State Retail Drug Code unless it contained a mark-up, and after the matter was discussed, it was agreed that 15% would be the lowest mark-up that would be acceptable, and the State Administrator was so informed.

On April 27th, another mass meeting was called, this time in the Auditorium of the Elks Club, Newark, at which there were present about 1500 pharmacists. Governor Moore and the State Administrator, Colonel Eisner, and Deputy Administrator Tepper were present. In a brief speech, Governor Moore stated that he was glad to be able to assist the pharmacists of New Jersey in making a decent living. The next day, Friday, he signed the code with the 15% mark-up included, which was to take effect the following Monday, but as there was not sufficient time to start the machinery going, the code did not become effective for another week.

The Code Authority was originally intended to consist of 15 druggists and 4 members

representing perfume shops, department stores, etc., and one member, appointed by the Governor, who had no vote. At the organization meeting of the Authority, the Drug Clerks Association thought they should have representation, so the Authority was enlarged and now numbers 21. George L. Mederer, a retail druggist of Newark, was elected director of the State Retail Drug Code Authority. The proposed set-up is, in addition to the director, one assistant director or counsel, 5 regional directors, each with a regional inspector working under him. All information and material will be mailed from the Newark office of the Director. On Monday of this week, a copy of the code and a list of prices was to have been mailed from the Newark office to every retail drug dealer of record in the state.

As I understand it, violations are to be brought to the attention of the regional director who will endeavor to induce the erring brother to comply with the code regulations. If he fails to do so, the matter is to be referred to the Compliance Director.

Secretary Loveland stated that the foregoing was a brief statement regarding the formation of the New Jersey State Retail Drug Code, which was signed by Governor Moore on April 28th and which is just now being put into effect. (Abstracted by Prescott Loveland.)

In reply to F. V. McCullough and Ralph W. Clark, Mr. Loveland said that the wages named were $35 per week of sixty hours. The Association of Drug Clerks desired seven 8-hour days. He stated further that the Code is on probation for sixty days. Ralph W. Clark referred to several complications of the State code in Wisconsin.

Mr. Riemenschneider inquired whether the legislation is part of the State Recovery Act; in reply, Mr. Loveland said, it is.

A. L. I. Winne said Virginia had a law which paralleled the Federal Act; violation can be punished under the State law.

Ralph W. Clark favored concentrating on the Federal code.

Prescott Loveland thought most druggists favored the State code.

J. W. Slocum stated that cost must be added in dozen price unless assumed by the manufacturer. He inquired whether the 15% mark-up was in addition to the defined cost. Mr. Loveland replied in the affirmative.

President Wilson called upon J. Lester Hayman, of West Virginia, to lead the discussion on the next topic—"Since the State Associations have been ignored in the National Drug Code set-up, what should be the attitude of the State Associations to code matters?" (No. 3.)

Mr. Hayman in the discussion took the attitude that it was the general opinion of most of the secretaries present that the State Associations had been ignored in Code matters with the exception of having been called upon to help in the organization of the Local Congressional District Code Authorities. He called attention to the fact that State Secretaries were called upon by members of the Local Trade Authorities for information and advice and under the present set-up such help could not be obtained either from the State Association or the National Code Authority, which resulted in unsatisfactory conditions in many of the districts.

He said that it was not the attitude of the State Association toward code matters that was particularly important, since all State Associations wanted to be of as much service as possible, the important question is—What may they do, under the circumstances, to be of service to their members?

President Wilson remarked that in answer to questions submitted to him, the National Code Authority replied that "We are busy corresponding with our districts and we haven't got time to talk with State Associations."

Mr. Hayman explained the difficulty experienced in calling the meetings for the election of the members of the Local Code Authorities, the delay and difficulties being due entirely to lack of information from the National Authority in regard to whether or not druggists from stores in towns of less than 2500 population were eligible to vote for the members of the Local Trade Authority. He thought the Local Trade Authorities, especially in the smaller districts, should be informed as to what they may or may not do under the code, and that at the present time due to lack of official information, are trying to follow rules and regulations of the larger cities, such as New York, Chicago, etc.

Charles J. Clayton said that he was under the impression that later on the operations of the code would be turned over to the various trade organizations, and that in their state the association

was drafting amendments to their constitution and by-laws so as to put their organization in a position to take care of the change if such was made.

Roy C. Reese and A. L. I. Winne contributed to the discussion by questions and the relating of similar experiences.

President Wilson appointed the Nominating Committee composed of the following: Mr. Hayman, Mr. Winne and Mr. Clark.

Mr. Slocum called attention to the lateness of the hour and the fact that there were several important topics to be discussed. Several secretaries expressed themselves as feeling that the Secretaries Conference was not given sufficient time. Mr. Hayman moved that the session be continued immediately following the Joint Session on Thursday evening. The motion was carried.

Mr. Reese moved for adjournment, and the motion carried.

The Extra Session of the Conference of Pharmaceutical Association Secretaries was convened May 10, 1934, at 11:15 P.M., by President R. C. Wilson.

F. V. McCullough said one thing to be considered was the recommendation of the President that this organization ought not to be confined to secretaries but that all officers of State Associations should belong.

Roy C. Reese stated that if the membership is limited to not over three officers of any association he would support the recommendation.

J. Lester Hayman said that he believed it would be better to merely invite the other officers to the meeting next year and that if the response was favorable a change could be made.

Prescott Loveland asked if it was the intention to invite all elected officers of a state association and President Wilson replied that he had in mind bringing to the attention of as many people as possible the work of this Conference. He said some associations would continue to send only one or two, but some might send three, four or ten and that it would be helpful in distributing the information brought out in the Conference meetings.

Roy C. Reese believed it would be better to hold the membership down and that more could be accomplished by limiting it to the President, Secretary and one other member. He expressed the opinion that the Conference would get farther and much more would be accomplished. He explained that a large group would consume hours and hours of argument and discussion.

J. J. Gill moved that the membership be limited to the President and Secretary; the motion was seconded by Mr. Reese.

A. L. I. Winne hoped that this motion would not be defeated. He made mention of the fact that he was largely responsible for the organization of the group in St. Louis and that at that time he had in mind the getting together of the secretaries who were the most active officers of the State associations. He said, however, that he wished that he had suggested a Conference of State Association Officials instead of State Association Secretaries. He had no objection to having all the officials of the State associations present nor any reason why they should be excluded from the discussions. He suggested that the name be changed to a "Conference of State Pharmaceutical Association Officials" and limit a vote to each State as represented in that body.

J. J. Gill thought the membership should be limited to the President and Secretary.

J. Lester Hayman did not believe it would be a good move to enlarge the membership at this time. He pointed out that Secretary Harring was absent on account of illness and that a copy of the by-laws was not procurable. This being the case it was not definitely known whether change in membership could be made in the by-laws at this meeting. He pointed out that the same purpose could be obtained by merely inviting the presidents or other officers for next year and if the response was favorable, then the membership could be enlarged; he could see no point in doing so without knowing whether or not it was constitutional, or without knowing whether or not the other officers would take an active part in the Conferences.

After further discussion—in which Messrs. Pilchard, McCullough, Gill, Winne, Hayman, Reese, Loveland and Wilson participated—the motion of Mr. Gill did not prevail.

F. V. McCullough said that President Wilson had the good of the Conference in mind when he made the recommendation and, at first, he thought well of it, but that after the discussion he didn't think so well of it. He stated that the Conference was interested in organization work, how to make out programs and how to collect dues, how to run the association. He thought that the Conference was primarily for secretaries and ought to be kept that way. He moved that

the Conference disregard the recommendation of the President; seconded by A. L. I. Winne. The motion was carried.

J. Lester Hayman moved that the Secretary of the Conference be instructed to send a cordial invitation to the presidents of the State Associations to meet with the Conference next year and take part in the deliberations.

Rowland Jones seconded the motion and moved to amend it to have the letter suggest to the President the importance of the Secretary attending these conventions, stating some state associations are not sold on the idea of having the Secretary attend. The mover accepted the amendment and stated that last year in his address he had suggested that it be a duty of the President of the Conference each year, to so address the President of each State Association. The motion was carried.

J. J. Gill thought that the meetings of the Conference should be held a little earlier during the convention; in his opinion they were about as important as anything transacted during the convention. As now held, in widely separated sessions, it was almost impossible to bring before the AMERICAN PHARMACEUTICAL ASSOCIATION matters of importance before adjournment.

The matter of special business for this session, which was held over at the request of Mr. Adams was postponed due to his absence.

A motion to adjourn was carried.

President Wilson appointed J. Lester Hayman and A. L. I. Winne members of the Committee on Nominations. (The foregoing report was abstracted by J. Lester Hayman of West Virginia.)

SECOND SESSION.

The Second Session of the Conference of Pharmaceutical Association Secretaries was convened by President Robert C. Wilson, May 11th, at 2:00 P.M. President Wilson called on Walter D. Adams to discuss phases of the President's address. The first question was disposed of following the presentation of A. L. I. Winne.

The second question related to the activities of national associations in securing membership in states, without conferring with state associations. The question was freely discussed by Messrs. Adams, Wilson, Clayton, Slocum and others. The following motion by President Wilson was adopted:

"It is the conviction and the belief of this body that the interests of Pharmacy in America be best served if all national groups will conduct their activities by coöperating with the various State pharmaceutical associations."

Lester J. Hayman presented the following resolution:

WHEREAS, the State pharmaceutical associations have been ignored in the set-up and administration of the National Retail Drug Trade Code Authority, and

WHEREAS, many of the local trade authorities set-up under said code for the enforcement of the provisions seem not to properly understand their authority in many questions concerning the enforcement of the provisions and are not permitted to make interpretations of its provisions, and

WHEREAS, the local Trade authorities turn to State pharmaceutical association secretaries for counsel and advice in many questions concerning the interpretations of the code, as well as to their duties and authority under such code, and

WHEREAS, it has been impossible to obtain the proper advice counsel and interpretations from the National Retail Drug Trade Code Authority, and

WHEREAS, such advice counsel and interpretations have extreme importance in the successful administration and enforcement of the code, therefore be it

Resolved, that the National Retail Drug Trade Code Authority be requested to take immediate steps to properly and promptly interpret the code when called upon to do so by either the local authority or the State pharmaceutical association secretaries.

On motion of J. Lester Hayman, seconded by Walter D. Adams and a vote the resolution was adopted.

Walter D. Adams requested that he be permitted to prepare the resolution on the death of Edgar D. Oslin, after returning to his home. Permission was granted to Mr. Adams; copy of the resolution is to be sent to Mrs. Oslin.

F. V. McCullough suggested that steps be taken to have weekly bulletins issued from Washington, during the sessions of Congress, advising State associations of legislative matters, brief

résumés of bills introduced. That State associations address the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists to take up this matter.

A motion to that end was made and carried.

Topic 4, owing to the absence of R. A. Turrell, was not discussed at this time.

Discussion on Topic 5 was opened by J. W. Slocum.

He referred to a tri-county organization in Iowa, seven or eight years ago; this body has been functioning ever since and has been enlarged. He attended as State Secretary, various district meetings but there was no great interest until the depression came when County groups were organized and then the druggists began to realize the possibilities. The entire ninety-nine counties have been organized.

Much good work has been done by Virgil C. Smith in securing information which made the druggists conscious of the need of group organization. At the monthly meetings items of importance are discussed and Mr. Smith has brought much information to them exemplified by charts; for example, the relation of ten cent items sold in department and ten cent stores, proportionately containing more than regular sizes. Druggists from adjoining states came to hear Mr. Smith.

Much enthusiasm was shown at the meeting of the State association. Manufacturers were ready to confer and those that supplied filling stations and ten cent stores were told and made to understand the situation—they were shown by examples.

Mr. Slocum stated that Iowa druggists had discovered, for the first time, the power of the retail druggists by getting together in groups; the dealing must be fair and reasonable and then a fight made for the right. This work cannot be done by a State association, but better by smaller groups. These groups have their own organizations and study their own problems. Secretary Slocum is preparing monthly bulletins to be sent out to the various groups in which questions which are of interest and importance are presented. This conforms with the thought of A. L. I. Winne.

President Wilson stated that Topic No. 9 was in line with the subject discussed by Secretary Slocum and called on Roy C. Reese, who gave examples of ten cent sizes and the great variety of the products. He referred to a meeting for which he had purchased a variety to illustrate his argument. Mr. Reese gave the relationship of some of these products in ten cent and regular sizes.

The presentation made at the Kansas meeting was repeated at the Missouri convention.

Mr. Reese said that there will now be improvements in many of these matters. He referred to an experience in New York City a number of years ago when he made an effort to call on the wholesalers; he found that many self-styled wholesalers were only designated as such, or at least mainly so, for receiving wholesaler's discount.

A. L. I. Winne offered a motion that the Secretary of the Conference prepare a communication for transmission to the secretaries of the State pharmaceutical associations and bring the subjects to the attention of their respective organizations. The wording was stated as follows, "that the Conference of Pharmaceutical Association Secretaries condemns the practice of any manufacturer who supplies medicines in a 10 cent-size package to outlets other than drug stores and refuses at the same time to supply such packages to the drug trade at a price the same as that charged to other outlets, provided such manufacturers are selling to the drug trade packages of the same product of a larger size." The resolution was adopted.

Mr. Winne stated that he would like to have the suggestion go out to the secretaries which will explain to them that if they wish to get up some discussion at their annual meetings they should have a collection of some of these 10 cent samples. In his opinion not all pharmacists are aware of the extent to which 10 cent packages are on the market nor do they know of the relation of the regular sizes to the sizes handled in 10 cent and department stores.

Mr. Reese said that he simply displayed the samples so that all could see for themselves.

The next item in the list of topics was No. 6. The discussion was opened by F. V. McCullough who explained the legislation in Indiana and how it applied to the drug stores. Mr. McCullough was of the opinion that if alcoholic beverages were handled with the same conscientious care as other medicines they could be handled satisfactorily. A number of questions were asked relative to the stamps which must be affixed to package goods and whether a physician could write a prescription for blended whisky.

He thought that if the prescription simply called for whisky then the official article had to be dispensed, but if a physician wrote for a blended whisky this could be dispensed as such.

President Wilson stated that owing to the absence of Secretary Beard Question No. 10 would not be discussed, unless some one desired to do so.

A. L. I. Winne and Walter D. Adams presented the following:

"*Resolved*, that the Conference of the Pharmaceutical Secretaries go on record as opposed to the policy of any manufacturer of distributing any of the medicinal products to filling stations, meat markets, pool rooms, etc., in any town or county where there is located a retail drug store." The resolution was adopted.

President Wilson referred back to Topic No. 1 which was discussed at considerable length by A. L. I. Winne and others. Mr. Winne referred to the address of President Swain of the A. PH. A to the House of Delegates, in which he spoke of his efforts to secure membership for the ASSOCIATION and that the results were disappointing and discouraging. In Mr. Winne's opinion the AMERICAN PHARMACEUTICAL ASSOCIATION would have to render a dual service if the object was to largely increase the membership, which might be affected by establishing a publication similar to that published by a number of State associations. He referred to the work that the AMERICAN PHARMACEUTICAL ASSOCIATION is constantly doing for retail druggists and very often the value is not fully understood. He hoped that the Conference would seriously consider taking up this matter with the AMERICAN PHARMACEUTICAL ASSOCIATION. There is not in existence to-day any national association of druggists that can lay claim to represent pharmacy in the United States. He was of the opinion that the only way to accomplish this was by the coöperation of all states working in an organized way to bring into one group all the members of the various State associations. He thought that State associations could increase their membership if they were in position to offer the benefits of both a local and a national tie-up.

J. B. Pilchard was of the opinion that a monthly bulletin concerning national matters and sent to every State secretary each month might solve the question.

A. L. I. Winne thought such a bulletin should carry the information relative to the work going on in Washington in a legislative way and other matters in which the druggists all over the country are interested.

J. B. Pilchard thought that instead of a separate journal which would incorporate the information, the state publications could be built up by carrying such items to the members.

A. L. I. Winne stated that it was necessary for pharmacy to have the support of a sufficiently large number to speak as representative.

President Wilson inquired whether a committee could be appointed from the Conference to confer with the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION on this matter.

F. V. McCullough suggested the following resolution:

"*Be it resolved*, that it is the opinion of the Conference of Pharmaceutical Association Secretaries that federation of State pharmaceutical associations should be formed at an early date and *further resolved* that the matter of such an organization be presented to the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION and to its Executive Committee." The motion was carried.

A. L. I. Winne did not want to make a motion but he hoped that when a committee is appointed the president of the Conference be included as a member of it.

President Wilson thanked the members for their coöperation and interest.

A. L. I. Winne stated that President Wilson had requested him to present a report regarding conflicting dates of Association Meetings in adjoining states. He said that consideration had been given, but it is a very difficult matter to arrange for these meetings without conflicting at times.

J. Lester Hayman reported for the Committee on Nominations as follows: For *President*, F. V. McCullough of Indiana; *First Vice-President*, J. W. Slocum of Iowa; *Second Vice-President*, Roy C. Reese, Kansas; *Secretary-Treasurer*, Carl G. A. Harring of Massachusetts; *Delegate to the House of Delegates*, Charles J. Clayton, Colorado; *Executive Committee*, Robert C. Wilson, J. J. Gill and W. E. Bingham.

On motion duly seconded and a vote, W. E. Bingham was delegated to cast the unanimous vote of the Conference for the nominees. At his request, he being one of the nominees, J. B. Pilchard was instructed to cast the vote.

The officers elected were then duly installed.

President McCullough said that it was his purpose to serve the Conference to the best of his ability and hoped for the support of all the members. He stated that soon after his return home he would prepare a bulletin from the notes he had made and send mimeographed copies to the members.

A. L. I. Winne asked the President to appoint the committee to confer with the AMERICAN PHARMACEUTICAL ASSOCIATION. The following committee was named: F. V. McCullough, J. Lester Hayman, A. L. I. Winne and R. C. Wilson.

The motion was made and duly seconded, giving a vote of thanks and appreciation to the retiring officers. The meeting of the Conference was then adjourned.

(Report of the Joint Meeting with the Section on Education and Legislation and Conference of Law Enforcement Officials, will be printed in the same issue with the Minutes of the Law Enforcement Officials.)

COMMITTEE REPORTS

REPORT OF COMMITTEE ON PRESCRIPTION TOLERANCES.*

BY HUGO H. SCHAEFER, CHAIRMAN.

The Committee on Prescription Tolerances has now been functioning for two years. During the first year no actual data were collected but a general study of the problems involved was made, meetings were held with Dr. Campbell, Chief of the Bureau of Food and Drug Administration, a news bulletin was prepared and sent out and the entire subject given as much publicity as possible. This was done with a view of obtaining sufficient publicity and to arouse enough interest to enable the Committee to obtain a large number of compounded prescriptions of which a study could be made. The chairman wishes to thank not only the members of his Committee but also Dr. R. L. Swain, of Baltimore, and Mr. John M. Woodside, of Harrisburg, Pennsylvania, for furnishing material and data.

The chief factors to be studied in connection with prescription tolerances are as follows:

(*a*) Moisture and allowable impurities in chemicals.
(*b*) Decomposition and deterioration.
(*c*) Unavoidable errors in the weight of the individual powders, pills or capsules.
(*d*) Unavoidable losses due to a portion of the prescription ingredients remaining in the mortar or adhering to utensils.
(*e*) Unavoidable errors in weighing and measuring.

It was realized that not all of these points could be properly considered at one time and the work of the past year was chiefly in connection with making a study of the unavoidable and normal variations in the weights of individual powders and capsules.

With this in view a prescription not subject to decomposition or moisture content changes was selected. It represented a mixture of powdered charcoal and magnesium oxide. Since the work of the Committee members consisted essentially of weighing the contents of the individual powders it was deemed necessary to first determine what losses this weighing operation involved. For this purpose 15-grain powders consisting of 10 grains of charcoal and 5 grains of heavy magnesium oxide were prepared by weighing the ingredients directly on a counterbalanced powder paper. The latter were then folded and placed in a prescription box. This operation was repeated with 10 grains as well as 5 grains of the mixture per powder. One set was prepared with ordinary powder papers and another with wax impregnated papers. The papers were then unfolded and the contents carefully transferred to a watch glass and weighed. The findings were as follows:

AVERAGE LOSS PER POWDER.

	Plain Paper.	Waxed Paper.
15-grain powders	0.05 grain	0.16 grain
10-grain powders	0.04 grain	0.14 grain
5-grain powders	0.035 grain	0.13 grain

* Presented before Section on Practical Pharmacy and Dispensing, A. PH. A., Washington meeting, 1934.

It will be noted that these variations are negligible but, of course, become proportionately greater with the smaller powders. While the above are average losses yet all of the 12 powders in any one set varied only very slightly from the mean. All in all the losses were considered negligible and not taken into consideration in further powder weight determinations of this particular mixture although, no doubt, the character of the powder may at times increase this error considerably.

Some 600 prescriptions of 10 powders each of the previously mentioned charcoal and magnesia mixture were obtained. They had been prepared by pharmacists, by students, by college instructors and by Board candidates as part of their practical examination. In no case were the compounders aware of the fact that the preparation was to be used for any special purpose. The contents of each of the powders were accurately weighed. The tabulation of the 6000 weights showed many interesting facts.

It was found that in a considerable number of prescriptions submitted the total weight of the contents of the 10 powders varied so greatly from the amount prescribed that it became apparent that the variations were due to one or more of the following factors:

(*a*) Faulty weights or balances.
(*b*) Errors in reading the prescriptions.
(*c*) Errors in calculation.
(*d*) Loss of powder through gross carelessness.

Since this study had as its object the determination of normal and average variations in the division of the powder mixture it became obvious that the introduction of these enumerated errors would only lead to confusion. Some 150 prescriptions which varied in total weight more than 10% from that prescribed were omitted from further study and consideration. Over 90% of these had been compounded by students and by Board examination candidates.

In general the prescriptions compounded by pharmacists varied only very slightly in total weights of contents.

The following list shows the total weight of the contents of ten sets of 15-grain powders taken at random:

146.5 grs.	147.1 grs.	154.2 grs.	146.2 grs.	151.7 grs.
143.2 grs.	143.8 grs.	144.6 grs.	148.3 grs.	152.1 grs.

The following can be taken as a cross section of the total weights of the 10-grain powders:

104.5 grs.	102.9 grs.	99.0 grs.	97.4 grs.	103.3 grs.
98.2 grs.	97.6 grs.	101.7 grs.	102.6 grs.	96.7 grs.

The 5-grain powders showed the following:

49.2 grs.	48.7 grs.	51.3 grs.	52.6 grs.	48.3 grs.
47.9 grs.	52.2 grs.	51.9 grs.	50.6 grs.	49.6 grs.

These figures are characteristic of the prescriptions compounded by pharmacists and show a considerable degree of accuracy. The average variation in the 15-grain powders is ±0.383 gr. per powder, for the 10-grain powders ±0.261 gr. per powder and for the 5-grain powders ±0.149 gr. per powder. The interesting point here is that the error becomes smaller as the powders become lighter although the percentage of error is about the same.

These figures would indicate that in a mixture of this kind losses due to faulty weighing, mixing in a mortar and transferring to powder papers are small when properly conducted. Unfortunately, however, this cannot be said of the variations found in the weights of the individual powders. It would seem that many physicians prescribe powders in order to be reasonably sure of proper dosage and the findings of this committee would indicate that there is much room for improvement of this phase of prescription compounding.

The following is a tabulation of the weights in grains of some of the 15-grain sets of powders taken at random:

No.										
1	10.6	15.3	13.2	9.5	17.2	16.3	15.2	14.3	16.4	17.0
2	13.7	14.6	15.3	15.0	15.4	14.1	13.9	14.2	15.6	16.2
3	13.5	16.1	15.9	14.8	15.1	13.9	16.2	14.9	13.9	14.2

4	18.6	16.3	12.2	16.5	17.2	11.6	14.1	13.9	12.8	15.0
5	16.5	16.1	15.0	14.9	13.9	16.5	15.1	14.8	14.7	15.2
6	14.6	14.9	15.2	15.9	13.9	16.0	15.3	14.6	14.1	15.1
7	11.2	11.9	17.2	15.8	16.9	18.0	12.2	10.9	14.2	17.2
8	12.6	14.3	15.9	12.1	14.9	16.2	17.0	14.9	15.2	16.0
9	13.8	14.2	14.1	16.3	16.1	14.8	15.2	15.7	14.9	16.2
10	10.6	17.8	17.2	16.9	12.3	13.4	16.8	16.5	15.1	17.3
11	19.7	16.3	14.2	17.6	11.2	13.8	14.2	16.5	15.3	16.5
12	14.6	14.0	13.9	16.2	16.3	15.2	15.7	15.6	14.9	16.1
13	14.3	14.9	16.1	14.7	15.3	15.6	15.1	15.4	19.9	16.3
14	15.2	15.0	14.6	14.9	14.1	16.1	13.9	15.5	14.2	16.2
15	18.2	17.3	14.3	15.7	12.1	11.0	10.9	17.2	15.4	15.1
16	17.6	15.2	14.3	13.2	12.6	18.0	17.1	12.2	15.4	17.2
17	14.3	13.9	15.1	16.2	15.3	15.9	16.1	14.0	15.2	13.8
18	14.1	15.9	15.2	15.0	16.0	15.5	13.9	14.1	14.3	15.2

These represent a good cross section of the 180 sets examined. The complete tabulation would be entirely too long and serve no good purpose at this time. This complete tabulation, however, shows that 53.3% of the sets consisted of powders which varied by less than ±1.5 grains from the theoretical 15 grains. 72.2% of the sets were made up of powders which varied less than ±2.25 grains. 83.8% of the sets were made up of powders which varied less than ±3 grains.

The 10-grain powders showed the following cross section:

No.										
1	9.2	8.0	12.0	10.2	10.9	7.6	11.9	11.9	8.1	10.3
2	12.2	10.6	10.1	11.9	8.6	8.7	9.2	10.3	9.6	8.6
3	9.2	9.6	10.4	10.6	9.1	11.0	9.7	9.1	10.7	9.9
4	9.7	10.2	10.6	9.3	10.2	10.3	9.2	10.1	9.7	9.2
5	10.3	10.6	10.7	9.2	9.1	9.7	10.8	10.6	9.4	9.7
6	7.3	8.9	13.6	13.9	7.9	10.4	10.9	12.2	12.1	7.4
7	8.1	11.7	11.3	8.9	9.1	10.8	11.7	11.9	8.8	8.2
8	8.4	8.9	11.7	10.2	11.6	9.8	10.1	8.8	11.2	10.2
9	10.6	10.5	9.5	9.8	9.9	10.2	10.0	10.9	9.1	10.7
10	9.7	10.0	10.1	10.5	9.6	9.8	9.6	9.2	10.7	10.2
11	7.9	7.4	6.9	14.2	8.9	10.6	10.1	7.8	9.2	14.5
12	8.7	7.9	12.1	12.3	10.8	10.7	9.2	9.9	10.2	10.8
13	10.6	10.1	9.8	9.2	9.5	10.6	10.1	10.0	9.9	10.4
14	10.5	10.2	10.3	10.1	10.0	9.1	9.2	9.4	9.4	9.2
15	10.4	11.0	9.9	9.7	9.5	10.3	10.2	10.0	9.7	9.1
16	7.2	8.4	12.3	10.6	10.2	10.1	11.9	11.8	9.6	9.9

The entire tabulation of 160 sets of 10-grain powders showed that 50.6% of the sets consisted of powders which varied by less than ±1 grain from the theoretical 10 grains. 69.4% varied less than ±1.5 grains and 82.5% varied less than ±2 grains.

The following will show the weight of the 5-grain powders:

No.										
1	4.7	4.9	5.2	5.1	5.3	5.4	4.9	4.7	4.6	4.8
2	4.1	4.3	5.7	5.2	5.6	5.7	5.9	4.3	4.7	4.1
3	4.9	4.6	5.3	5.4	5.0	4.5	4.7	4.8	5.1	4.5
4	4.0	5.7	5.9	6.1	3.9	4.2	4.9	5.8	4.1	3.9
5	3.8	7.1	7.0	4.1	4.3	4.6	4.2	4.7	5.1	5.5
6	7.0	6.9	3.9	4.7	4.6	5.2	5.4	4.7	4.9	4.6
7	4.7	5.2	5.3	4.6	4.5	5.4	5.4	5.2	4.9	4.6
8	4.6	4.8	4.7	4.9	5.2	5.5	5.0	5.1	4.7	4.5
9	4.7	4.6	5.2	5.3	5.4	5.0	4.7	4.9	4.8	5.3
10	5.1	5.7	5.4	5.2	4.6	4.6	4.9	4.5	4.7	4.7

No.										
11	3.9	4.2	7.2	6.5	5.4	5.1	4.0	4.7	4.6	4.9
12	4.1	4.7	4.6	4.9	4.3	5.4	5.5	5.2	5.3	5.0
13	6.2	6.4	6.3	4.1	4.5	4.2	4.3	5.1	5.0	5.5
14	4.2	4.8	4.9	4.7	5.3	5.8	5.9	5.2	5.0	5.9

A total of 140 sets of 5-grain powders were tabulated as to their individual weights and showed that 50% varied by less than ±0.5 grains. 70.7% varied by less than ±0.75 grains and 80.7% by less than ±1.0 grain.

An abstract of all of the preceding findings would show the following:

Number of powder prescriptions studied, 600 (10 powders each).

Number eliminated because of excessive variation in gross weight, 150 or 25%.

	% of Sets within ±10% Variation.	% of Sets within ±15% Variation.	% of Sets within ±20% Variation.
15-grain powders	53.3	72.2	83.8
10-grain powders	50.6	69.4	82.5
5-grain powders	50.0	70.7	80.7

It would seem, therefore, that in ordinary powder prescription compounding there is little difference in the degree of accuracy obtained with powders of different weights. It would also seem that there is considerable room for a greater degree of accuracy than that commonly practiced in the division of the powder mixture.

No data were obtained as to the exact method by which the powders had been divided in the compounding of these prescriptions. Probably most of them were divided by the "eye" method and not weighed individually as that seems to be the general practice. In this connection it was reported by a member of this Committee that as much as a 1-grain variation was found in the weights of the powder papers in a box of 500 (No. 40) papers examined. This would indicate that if the powders are weighed individually it should be done by use of a counterbalanced watch glass and not by weighing with or on the paper. Your chairman has found that a group of advanced pharmacy students when told in advance that the contents of the papers would be weighed could prepare 5-, 10- and 15-grain powders all within a ±10% variation by the "eye" method. A variation of 1 grain in the weights of the empty powder papers would prevent this degree of accuracy particularly in the lighter mixtures when made by weighing the individual powders on the papers. It seems reasonable to suppose that the prescription pharmacist could use the same degree of skill in his ordinary work.

CONCLUSIONS ON POWDER PRESCRIPTIONS.

That in a prescription of this general nature the gross weight of the powders should not vary more than ±5% from the theoretical weight.

That in the division of the powders the "eye" method is satisfactory.

That the variations in the weights of the individual powders should not exceed ±10% from the gross weight divided by the number of powders in the prescription.

VARIATIONS IN CAPSULE PRESCRIPTIONS.

A study was begun by our Committee of normal variations in the weights of capsule contents. This study is far from complete and may therefore be considered in the nature of a preliminary report.

Since the usual practice of pharmacists in filling capsule prescriptions is to weigh each filled capsule and using as a counterbalance an empty capsule it was thought important to determine variations in the weights of empty capsules with the following findings:

	Number Weighed.	Average Wt. per Capsule.	Wt. of Lightest Capsule.	Wt. of Heaviest Capsule.	Average ± Variation from Mean Capsule Wt.
No. 0 capsule	200	0.1084 Gm.	0.0892 Gm.	0.1262 Gm.	11.9%
No. 1 capsule	200	0.08809 Gm.	0.0798 Gm.	0.1012 Gm.	9.2%
No. 4 capsule	200	0.03740 Gm.	0.0310 Gm.	0.0411 Gm.	8.1%

These figures prove that the variations in the weights of the empty capsules themselves are so great as to preclude a degree of accuracy comparable with the results obtained in the preceding study of the powder weights. The average empty capsule weight varies about 10% from the average weight of a large number. A few capsule prescriptions were obtained and the contents of the individual capsules weighed. While the number of determinations were not considered large enough to allow of any final conclusions yet the following tabulation will give some insight as to what may be expected. The same charcoal and magnesia mixture employed in the powder investigation was again used and 50 weights of each size were determined.

5-Grain Capsules (5 Sets of 10 Capsules Each).

Gross weight of sets in grains	46.2	44.3	47.2	42.1	45.6

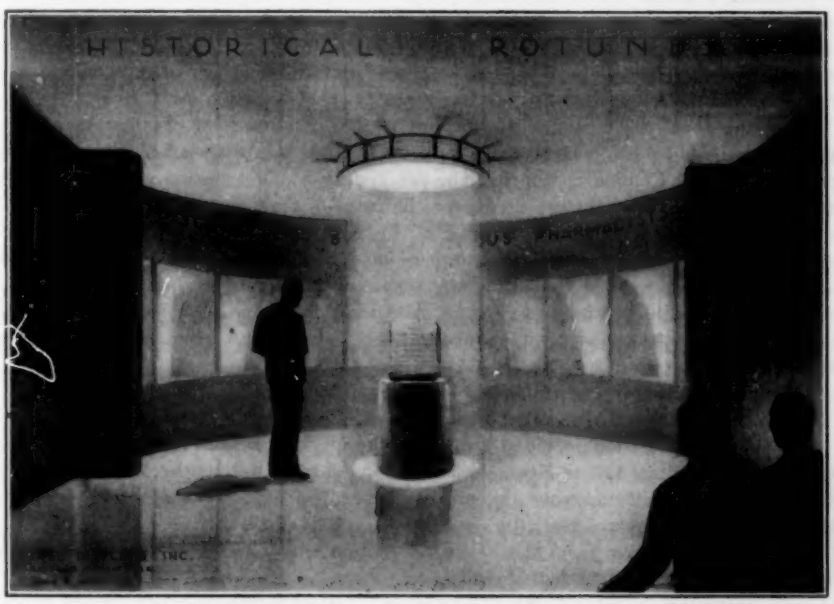
Average ± variation —14.2%
Highest individual capsule content—5.62 grains
Lowest individual capsule content—3.15 grains

3-Grain Capsules (5 Sets of 10 Capsules Each).

Gross weights of sets in grains	26.5	24.6	23.2	27.8	26.3

Average ± variation—16.3%
Highest individual capsule content—3.23 grains
Lowest individual capsule content—1.9 grains

A study of the tabulation made shows that in any single set the contents of the individual capsules run as a rule fairly constant for seven or eight capsules and then there are several which run far under or over weight. This of course can be explained by the fact that the compounder filled the first capsules fairly uniformly but found toward the end that there was either too much or too little powder left for the last few capsules. Further determinations and more study must however, be given to capsule compounding.



The Historical Rotunda tells the story of discoveries, and spaces are assigned to portraits of famous pharmacists; the American Pharmacy Building is featured. In order to interest the public a portion of Ebers Papyrus is shown of the World's oldest prescription.

ASSOCIATION BUSINESS

THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1934–1935.

Office of the Secretary, 2215 Constitution Ave., Washington, D. C.

LETTER NO. 2.

July 19, 1934.

To the Members of the Council:

The following Council business is submitted to the Council for approval. It includes the minutes of the organization meeting of the Council on May 11th, and the minutes of the Executive Committee meeting on July 17th.

For the benefit of the new members of the Council it is pointed out that motions made by mail in the interim between meetings of the Council require no second.

(*Motion No. 1*) *It is moved by Kelly that the minutes of the First Meeting of the Council 1934–1935, as presented in Council Letter No. 1, May* JOURNAL, *page 515, be approved.*

20. Appointment of Executive Committee and Call of Meeting. Pursuant to Item 12, Council Letter No. 1, Chairman Hilton, on July 10th, announced the appointment of the following Executive Committee of the Council and called a meeting of the Committee for Tuesday, July 17th, at the American Institute of Pharmacy, at 10:00 A.M. (E. S. T.): Robert P. Fischelis, H. A. B. Dunning, A. G. DuMez, C. H. LaWall, C. W. Holton, H. V. Arny, W. Bruce Philip, E. G. Eberle, S. L. Hilton and E. F. Kelly.

21. Meeting of the Executive Committee. Upon call of Chairman Hilton, a meeting of the Executive Committee of the Council was held at 2215 Constitution Avenue, Washington, D. C., on July 17th. The minutes of the meeting are as follows:

"The meeting was called to order by Chairman Hilton at 10:15 A.M., with all members present. A message from former President Swain was read, expressing regrets that he was prevented by a previous engagement from accepting the invitation to attend.

"President Fischelis called attention to what he considered errors or discrepancies in the printed minutes of the reorganization meeting and, in connection with Item 19 in Council Letter No. 1, to the fact that he had submitted a motion that the unfinished business of the Council and such new business as might come before it, be considered at a meeting of the Council or of the Executive Committee to be called by the chairman.

"After a general discussion of the proceedings and minutes of the first meeting of the Council, it was moved by Fischelis that a committee of three be appointed to formulate a motion to be presented to the Council to approve the proceedings. This motion was amended to read that the committee consist of the president, the chairman of the Council and the secretary. The motion was seconded by Arny and carried.

"Dr. Dunning, chairman of the Committee on Maintenance, then discussed in detail his plans for securing a maintenance fund and plans for the utilization of the building, as well as plans for additions to the building and equipment. A general discussion followed in which details of the future plans of the ASSOCIATION in connection with the American Institute of Pharmacy were given careful consideration.

"At 2:00 P.M. the meeting adjourned for lunch.

"The meeting was called to order by Chairman Hilton at 3:00 P.M.

"The special committee provided for during the morning session reported that corrections in Items 1 and 12, Council Letter No. 1, had been agreed to as well as the opening paragraph of Letter 2 and the motion to approve the proceedings. The report was accepted on motion of LaWall, seconded by Arny and carried.

"The recommendation from the Scientific Section that Chapter IX, Article VIII of the By-Laws of the section, be amended to read as follows:

> "All papers, which shall be in duplicate, and reports presented to the Section become the property of the ASSOCIATION, one copy of the papers and of the reports shall be forwarded to the Editor of the JOURNAL immediately following the annual

meeting of the Section, the other copy of the papers shall be submitted to the chairman of the Committee on Ebert Prize by the secretary of the Section."

was approved on motion of LaWall, seconded by Arny and carried.

"It was moved by DuMez that all papers presented before the sections be submitted in duplicate and that the secretary so advise the chairmen of the sections. The motion was seconded by LaWall and carried.

"The following communication from the Section on Practical Pharmacy and Dispensing was read:

"To the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION:

"The Section on Practical Pharmacy and Dispensing at their Second Session held Friday afternoon, May 11th, passed the following resolution:

"It is recommended that the Section on Practical Pharmacy and Dispensing request the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION to appropriate an additional $50 for our Section. This additional $50 to be used in collecting and correlating propaganda that has been used in the various cities, counties and states in this country for promoting professional pharmacy. This propaganda will include work such as that of the Interprofessional Relationship Committees, U.S.P. and N.F. Publicity Committees, and Hospital Formularies... The purpose of this information is not for the AMERICAN PHARMACEUTICAL ASSOCIATION to carry on an expensive publicity campaign, but to collect data which will act as a guide for the various city, county and state associations that are interested in work of this nature.

"We further suggest that inasmuch as the Section on Education and Legislation has considered a somewhat similar undertaking it be invited to participate in a coöperative plan whereby its efforts will be devoted to the collection of dental propaganda and the efforts of this section to the medical and all other propaganda.

"It is further suggested that this body go on record to the effect that the section's funds which might be appropriated for such work be disbursed only in the collection of the desired information.

"In accordance with the By-Laws of our Section, we therefore request that the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION appropriate the additional $50 to carry out this project.

Respectfully submitted,
MARVIN J. ANDREWS, *Chairman.*
L. WAIT RISING, *Delegate to the House of Delegates.*"

On motion of Philip, seconded by Holton and carried, the requested appropriation was added to the budget for 1934.

"The following report was read:

"The American Council on Pharmaceutical Education has not yet begun to function, except to act upon some matters referred to it by its constituent organizations, and to lay the ground work for the future development of the main project. The reasons for this are two in number, namely, there was a lack of funds with which to meet the budget agreed upon last year (at the Madison, Wisconsin, meeting held on August 27, 1933), and conditions prevalent in the field of education during the preceding year were so bad that it was believed it would be unwise to intrude a new factor at this time. The financial situation now seems to be clearing, and it is our intention to go ahead with the work as rapidly as possible during the coming year.

"Our plans call for the immediate request of an appropriation of $200 from each of the associations represented on the Council which will give a total of $600 to work with. This will be used largely to defray the expenses of cutting stencils and sending out letters to secure comments and criticisms of the plan for the standardization of schools submitted by Dean Leigh of Florida two years ago, and which we agreed to use as the basis for the beginning of our studies. It is intended to send out copies of these standards to a selected number of outstanding educators with the request that they criticize and comment on them, also to the AMERICAN PHARMACEUTICAL ASSOCIATION, the Secretaries of the State Boards of Pharmacy, the Deans of the Colleges of Pharmacy. The latter will be requested to submit them to the members of their faculties so that the

viewpoint of the teacher may be obtained as well as that of the administrator and law enforcement official. As these comments are received, they will be classified and studied with a view to molding them into a composite whole which will be both idealistic and practical in character.

"With regard to the matters referred to the Council by the constituent organizations the following report is made:

"With respect to the question submitted by the chairman of the Executive Committee of the American Association of Colleges of Pharmacy, 'What advanced credit shall be given for work done in non-pharmaceutical and non-member colleges?' it is recommended that only such credits be accepted as are approved for the fulfilment of the requirements of a Baccalaureate Degree by a recognized standardizing educational body, the State Department of Education or the State University of the State in which the respective college is located.

"The Council still has under advisement the matter of undertaking a study of practical experience which was also referred to it by the American Association of Colleges of Pharmacy. Much thought has been given to this subject, and it has been discussed at considerable length. The consensus of opinion of the members of the Council is that the work involved in making the investigations required would be as great if not greater at this time than that of formulating standards for the colleges, and that it is unreasonable to expect the Council to undertake both tasks at the same time.

Respectfully submitted,

A. G. DuMez, *Secretary*."

The report was received and the requested appropriation was added to the budget for 1934, on motion of LaWall seconded by Holton and carried.

"The following communication was read:

"At the annual meeting of the American Association of Colleges of Pharmacy held in Washington last month the following recommendation was adopted: 'That, inasmuch as all drug commodities are primarily health concerns, the American Association of Colleges of Pharmacy goes on record as urging that the manufacture, jobbing and retailing of these commodities be under the direct control of properly qualified pharmacists, and further that our action be broadcast to all organizations represented in the National Drug Trade Conference and that we ask their support as a public health measure."

The recommendation was endorsed on motion of LaWall seconded by Philip and carried.

"The secretary advised that an official invitation to the members of the Council to attend the annual joint meeting with the members of the Executive Committee of the N. A. R. D. during the coming convention of that Association in New Orleans, had been received. It was moved by LaWall that the invitation be accepted, that those members of the Council attending the convention be requested to attend the joint meeting and that the secretary be authorized to attend the convention as the official representative of the Association. The motion was seconded by Arny and carried.

"It was moved by Holton, seconded by Eberle, that the loan authorized under Item 18, Council Letter No. 1, be increased to $40,000. The motion was carried.

"As the Reading Room of the American Institute of Pharmacy had been equipped in honor of F. M. Apple, to the extent of funds bequeathed by him, it was moved by LaWall that the Apple Fund amounting to $1607.05 be transferred to the Headquarters Building Fund. The motion was seconded by Holton and carried.

"On motion of Fischelis, seconded by LaWall and carried, the Editor of the JOURNAL was authorized to attach a statement to the minutes of the Section on Education and Legislation when printed to the effect that the resolution of the Section in reference to a proposed National Committee on Professional Information did not reach the Committee on Resolutions in time to be acted upon and that it will, therefore, have to come before the next annual meeting for action.

"The President was furnished upon his request with certain advice and information with respect to his appointments and stated that he was not prepared to submit the entire list for approval until later.

"After a further discussion of the subject, it was moved by Fischelis that each member of the Council be requested to submit in written form, his ideas for the activities to be undertaken in

the American Institute of Pharmacy in addition to those already announced and that a digest of the suggestions received, be submitted to the members of the Council for comment. The motion was seconded by Arny and carried.

"President Fischelis then asked the opinion of those present on the following subjects: Proposed merger of the AMERICAN PHARMACEUTICAL ASSOCIATION and National Association of Retail Druggists as advocated by a number of state pharmaceutical associations; proposed federation of state associations and possible affiliation of such federation with the national associations; proposed consolidation of dues of national and state associations; possibility of organizing certain surveys and other activities in the American Institute of Pharmacy if funds are provided from outside sources; status of the American Institute of Pharmacy in relation to the AMERICAN PHARMACEUTICAL ASSOCIATION; proposed plan for a Council of Pharmaceutical Practice as advocated by Professor Cook; study of state codes; study of laws pertaining to the sale of drugs and medicines with the possibility of suggesting a model state law; possibility of enlisting support of the American Bar Association in studies of pharmaceutical legislation; plans for increasing the membership of the ASSOCIATION; better coördination of the programs and activities of sections of the ASSOCIATION and local branches; food and drug legislation; and program for the annual meeting.

"A number of these topics were discussed in some detail. It was decided to request the special committee of the Council appointed to study the proposed plan for a Council on Pharmaceutical Practice to arrange for a meeting at an early date for the purpose of discussion and making definite recommendations to the Council.

"On motion of Arny seconded by DuMez and carried, the meeting adjourned at 8:10 P.M."

(*Motion No. 2*) *It is moved by Kelly that the minutes of the Executive Committee as presented herewith be approved by the Council and that the actions of the Executive Committee become the actions of the Council.*

E. F. KELLY, *Secretary.*

LETTER NO. 3.

July 31, 1934.

To the Members of the Council:

22. Committee on Maintenance. The following communication has been received from President Fischelis:

> "In view of the fact that the adoption of Resolution No. 1 at the recent annual convention abolishes the previous Committees on Headquarters Campaign, Site and Plans, and substitutes for these committees a committee to be known as 'The American Institute of Pharmacy Maintenance Committee,' I deem it necessary to announce the appointment of this committee without further delay.
>
> "Resolution No. 1 passed at the recent Washington convention specifically states that Dr. H. A. B. Dunning be asked to assume the chairmanship of the Maintenance Committee.
>
> "At the meeting of the Executive Committee of the Council held in Washington on July 17th, Mr. Dunning agreed to accept the chairmanship, and upon request of the president, suggested the following associates: E. F. Kelly, R. L. Swain, S. L. Hilton and R. P. Fischelis.
>
> "I ask that the Council approve these appointments so that the functioning of this committee will not be delayed in any way."

(*Motion No. 3*) *It is moved by Eberle that the Committee on Maintenance as given above be approved.*

23. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 1, George E. Thornton, 618 S. Washtenaw Ave., Chicago, Ill.; No. 2, Charles Salameno, 100 Prospect St., Paterson, N. J.; No. 3, Kliau Bunnag, Government Chem. Lab., Bangkok, Siam; No. 4, Edward Krajcik, 695 Madison Avenue, Bridgeport, Conn.; No. 5, M. Joseph Fadgen, 1552 Gorsuch Ave., Baltimore, Md.; No. 6, Lawrence DeWitt Robertson, Freewater, Oregon; No. 7, Earl Mann, c/o Wm. Beaumont General Hospital, El Paso, Texas; No. 8, John J. Ilcisin, 1392 Hodgkiss St., Pittsburgh, Pa.; No. 9, James Burks Harley, 1101 O St., Lincoln, Nebr.; No. 10, C. S. Ladd, Box 568, Bismarck, N. Dak.; No. 11, Harry H. Harley, 1101 O St.,

Lincoln, Nebr.; No. 12, Attilio Ralph Granito, 95 Main St., Hackensack, N. J.; No. 13, Albert Coco, 546 Morris St., Orange, N. J.; No. 14, Arthur Pfetsch Markendorf, 2201 W. Broadway, Louisville, Ky.; No. 15, J. Gilbert Joseph, 1513 Eutaw Place, Baltimore, Md.; No. 16, Edward Watson Woolard, 134 Garnett, Henderson, N. C.; No. 17, Isidor L. Berger, 3835 Fullerton Ave., Chicago, Ill.; No. 18, Martin M. de Long, 5779 E. Circle Ave., Chicago, Ill.; No. 19, Isadore Goldberg, 3014 Georgia Ave., N. W., Washington, D. C.; No. 20, Dorothy C. McGovern, 736 Irving Ave., Syracuse, N. Y.; No. 21, A. Henry Weinstein, 1016 Eye St., N. W., Washington, D. C.; No. 22, Joseph Jenkins, 3265 Romona Blvd., Los Angeles, Calif.; No. 23, Carmine R. Auricchio, 143 Kingsland Ave., Brooklyn, N. Y.; No. 24, Bernard J. Schiller, 4107 Murray Ave., Pittsburgh, Pa.; No. 25, Everett Henry Behm, Mondamin, Iowa; No. 26, Benjamin Elkind, 2036 Wightman St., Pittsburgh, Pa.; No. 27, Benjamin S. Goldstein, 224 Norton St., Rochester, N. Y.; No. 28, Sylvia Rapoport, 21 Waumbeck St., Roxbury, Mass.; No. 29, Angelo P. Papulis, 30 Williams St., Chelsea, Mass.; No. 30, Isidor S. Tolpin, 418 Boston St., Lynn, Mass.; No. 31, John A. MacKenzie, 45 Regent Circle, Brookline, Mass.; No. 32, Phyllis Toon, 33 Howitt Road, West Roxbury, Mass.; No. 33, Elizabeth H. Wismer, 83 Congreve St., Roslindale, Mass.; No. 34, Harry S. Berinstein, 139 Chestnut St., Springfield, Mass.; No. 35, James N. Stearns, Y. M. C. A., Madison Ave., Memphis, Tenn.; No. 36, Russell Edward Brillhart, 885 E. Market St., York, Penna.; No. 37, Lawrence S. Stovall, Maupin, Oregon; No. 38, Wm. E. H. Schneider, Jr., 90 Engle St., Englewood, N. J.; No. 39, Vernon T. E. Westervelt, 906 Benjamin Ave., Grand Rapids, Mich.; No. 40, Gerard Andrew Sormani, 374 Central Ave., Brooklyn, N. Y.; No. 41, Susanno T. Blechle, 1431 N. Claremont Ave., Chicago, Ill.

(*Motion No. 4*) *Vote on applications for membership in the American Pharmaceutical Association.*

E. F. KELLY, *Secretary.*

Detailed view of the west wall of the Pharmacy Exhibit, Chicago World's Fair; the platform at the left is part of the Historical Rotunda.

EDITORIAL NOTES

A CORRECTION.

Throughout the article "The Absorption of Calcium," JOUR. A. PH. A., Vol. XXIII (1934), 7, 656, "Inosite Hexacalcium Gluconate" should be "Phosphate."—A. R. B., Jr.

THE BRITISH PHARMACEUTICAL SOCIETY'S EDUCATIONAL POLICY.

H. N. Linstead, Secretary and Registrar of the British Pharmaceutical Society, whose visit in this country—when the AMERICAN PHARMACEUTICAL ASSOCIATION held its annual meeting in Toronto, 1932—will be remembered by many who made the acquaintance of this well and favorably known pharmacist. He discussed the Society's educational policy at a meeting of delegates on July 17th. Before introducing his subject, he referred to the principal changes in the examination regulations as follows:

1. The dividing of the old botany of the Preliminary Scientific examination into botany and zoölogy.
2. The abolition of chemistry and botany as such from the Pharmaceutical Chemist examination.
3. The introduction of physiology as a subject of both the Chemist and Druggist and Pharmaceutical Chemist examinations.
4. The reversion to the old system whereby the Chemist and Druggist course becomes the first year of the Pharmaceutical Chemist course.
5. The abolition of a period of apprenticeship for the Pharmaceutical Chemist qualification and the substitution of two years' practical experience before or after the examination but before registration.

In discussing the need of wider education for pharmacists he presented the question by references and comments to the work which comes within the pharmacist's province:

1. It is the function of the pharmacist to furnish the physician with the medicaments he requires;
2. By its charter, the Pharmaceutical Society of Great Britain is expressly charged with the duty of "advancing chemistry and pharmacy;"
3. If we do not participate in this work, but leave it to others to perform, we are inevitably going to reduce ourselves to the position of mere dispensers, and in course of time mere handers-out of ready compounded articles;
4. Unless pharmacy provides the facilities for this type of work, the best students will either never enter our ranks, or, if they do, will leave us to seek the opportunities for additional education and research elsewhere;
5. For the benefit of every person on the pharmaceutical register we want to see within the Pharmaceutical Society all the best brains engaged on pharmaceutical work; we know that there is scope within pharmacy for the very best students turned out by the secondary schools and universities.

In his closing remarks Mr. Linstead said:

"I am conscious that there are many of you who feel that we are to-day, as a calling, more than fitted for our daily needs. That that is so I am not prepared to admit. Judging by the standard of the work that falls to a large number of pharmacists to-day, there may be some truth in that statement. But if we look at the problem from the point of view of what pharmacists might be doing or ought to be doing, then it becomes clearer that we cannot give too much attention to the scientific development of pharmacy. Unless pharmacy is scientific it has no reason for its existence."

Nearly one hundred years ago Jacob Bell wrote in *The Pharmaceutical Journal:*

"'In conclusion, it may be as well to recapitulate the moral which may be drawn from our past history, namely, that, political controversies and mercenary disputes are injurious to the interest and character of all parties—that the most effectual method which any class of men can adopt for securing their political rights, and advancing their professional standing, consists not in disputation and warm argument, but in a steady and persevering attention to intellectual improvement, and the establishment of such regulations as are calculated to ensure collective privileges by increasing the amount of individual merit.'

"There is a good deal of smug Victorianism in that, but the main object is clear. Those words are true to-day, and always will be true..."

REVISION OF THE NRA.

In the order of development, it was to be expected that the NRA would have to undergo revision. It is not a fault of the Administration, but a second phase of the development; a very important one, if it is to mean permanent establishment. While admitting failures, the new deal can certainly claim successes. In the revision it is the task of the Recovery Administration to discard the bad and retain the good and not over-complicate by adding complications. It is hoped and rightfully expected that the public will be patient and give the NRA time to vindicate itself; confidence and faith in the Administration's efforts, and fair dealing and direction on the part of the Administration offices are not only important but essential.

PHARMACISTS' PART IN ETHER AND CHLOROFORM ANÆSTHESIA.

David F. Jones, former president A. PH. A., on the occasion of the State meeting of South Dakota physicians and surgeons installed a window representing a miniature operating room, which caused much favorable comment. We do not know whether Dr. Jones brought into his exhibit historical references to the part pharmacists had in the early use of ether and of chloroform. The PROCEEDINGS of the ASSOCIATION and the JOURNAL have many articles on the discovery of ether anæsthesia—see editorial, October 1933, JOURNAL A. PH. A., page 937. See page 70 (1932), JOURNAL A. PH. A., for note on "Chloroform Pharmacy." See also "The Centenary of Chloroform," JOURNAL A. PH. A., for May 1931, page 481. Recently, J. P. Gilmour, former editor of the *Pharmaceutical Journal* (Great Britain) has contributed a comprehensive article to the *Chemist and Druggist* on "Simpson's Discovery," wherein mention is made to David Waldie, Duncan Flockhart & Co., pharmacists of Edinburgh, and to E. Northway Nutt, prominent in affairs of the British Pharmaceutical Society.

MATÉ.

From time to time efforts have been made to introduce maté, Paraguay Tea, as a daily beverage. Just now the use of it is being studied for the Army troops. Many references may be found in the Index to the PROCEEDINGS. In the volume for 1884 an historical article by Dr. Peckholt is abstracted and in the JOURNAL for 1922, page 609, is a comprehensive report on "The Astringent Principle of Maté," by Josiah C. and Bertha L. DeG. Peacock. The content of caffeine according to Dr. Peckholt varies greatly and seemingly, due to the source of supply. It would, therefore, seem that if the variation is as stated, the amount of caffeine in the product should be given.

PERSONAL AND NEWS ITEMS.

Among the speakers, not mentioned heretofore, at the Century of Progress in Chicago, are **Prof. Charles E. Smyithe,** of the School of Pharmacy, University of Minnesota, and **Prof. Freeman P. Stroup,** of the Philadelphia College of Pharmacy and Science.

Edwin E. Taiber, in a communication to the JOURNAL, commends the NRA in no uncertain terms.

Dr. Noel E. Foss is now a member of the faculty of Duquesne University, School of Pharmacy; he will supervise research in certain fields of organic chemistry.

Ambrose Hunsberger, assistant administrator of the Federal Alcohol Board, is recovering nicely, following an appendicitis operation.

Julius A. Koch, former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, was guest of honor at the annual Alumni Reunion banquet of the School of Pharmacy, of the University of Pittsburgh. This was the 50th anniversary of his graduation from the school.

Heber W. Youngken and Ivor Griffith were honored with the degree of Doctor of Science by Bucknell University. This was the 25th anniversary of the graduation of the former from Bucknell with the A.B. degree.

Among recent visitors at the American Institute of Pharmacy were **Prof. E. N. Gathercoal, Mr. and Mrs. Frank H. Freericks; John E. Kramer,** registrar Philadelphia College of Pharmacy and Science; W. M. Hankins, Florida Board of Pharmacy; **Prof. St. Elmo Brady,** Fisk University; **Prof. Leon Monell,** Buffalo University; **S. Ruffin Horne,** Fayetteville, N. C.

R. R. Gaw, Pennsylvania Pharmaceutical Association, in his presidential address, gave his views relative to the trend of pharmacy.

Miss Mary Robinson—daughter of the late James Scott Robinson, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, 1869–1923, Memphis, Tenn.—has erected a

building for his pharmacy as a memorial to her father. It is a beautiful structure, expressive of Mr. Robinson's conception of pharmacy. For more than 60 years, 36,000 prescriptions annually have been dispensed in this pharmacy; Frank W. Ward, long an associate, presides over this well and favorably known establishment.

Dr. Roland Schaffert has been made instructor in physics at Duquesne University.

Prescott R. Loveland, secretary of New Jersey Pharmaceutical Association, is secretary of the state committee on Public Health and Welfare.

Charles H. Blaney, of Baltimore, donated a large brass counter balance with a set of block weights to the American Institute of Pharmacy. The pans are 10 inches in diameter and the standard is about 29 inches tall; the arms of the beam are stamped "Baltimore."

Mrs. C. W. Richardson, of Washington, D. C., has donated a stone mortar from Sothern's drug store, and an ointment jar, from the drug store of a brother of John Paul Jones, in Fredericksburg, Va.

THE UNITED MEDICINE MANUFACTURERS.

The United Medicine Manufacturers of America will hold its annual business convention in the Waldorf-Astoria, New York City, October 10th to 12th. Among the most important subjects to be taken under consideration in the three-day meeting will be the elimination of false and misleading advertising; wholesale and retail drug trade relations; Department of Agriculture and Federal Trade Commission activities; drug code developments and legal and legislative action.

OBITUARY.

GEORGE F. BIGHAM.

George F. Bigham, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, second vice-president of the National Association of Retail Druggists and a member of the Bigham-Dambach Drug Company of Buffalo, New York, died at his home, July 31st, following a stroke suffered the day before. He was born in Ontario 61 years ago. He came to Buffalo, N. Y., 35 years since and had been in the drug business there until now. Mr. Bigham had been president of both the Buffalo and New York State Pharmaceutical Association and the Greater Buffalo Drug Club, and was treasurer of the Western New York Trades Conference. He is survived by his widow and a brother, J. Clayton Bigham of Vancouver.

W. E. GREINER.

W. E. Greiner, vice-president of the Southwestern Drug Corporation and prominent in Dallas, Tex., civic life for many years, died August 16th. He was a member of the Dallas Board of Education for many years, serving as president for seven years, and he was the first president of the Dallas Athletic Club, which he helped organize. He also served as president of the National Association of Wholesale Druggists. Mr. Greiner graduated from Chicago College of Pharmacy in 1888. He is survived by his wife, one son, William E. Jr., and a daughter, Miss Adelia Greiner.

EDWARD CRAWFORD LONG.

The funeral ceremonies for Edward Crawford Long, son of Crawford W. Long, were held in San Antonio, Texas, July 26th. Mention is here made because of his father's discovery of ether as an anæsthetic. Sketches of the latter have appeared in the PROCEEDINGS and the JOURNAL OF THE ASSOCIATION.

James C. Munn, former secretary of the Northern California Retail Druggists' Association and a pharmacist of Oakland, died at the Johns Hopkins Hospital in Baltimore, Md., June 1st.

A native of South Dakota and a graduate of Northwestern University, Chicago, class of 1917, Mr. Munn came to California ten years ago. He took an active interest in association affairs, served as president of the Alameda County Pharmaceutical Association and was one of the prime movers in the formation of the Northern California Retail Druggists' Association.

SOCIETIES AND COLLEGES.

TENTH ANNUAL OBSERVANCE OF NATIONAL PHARMACY WEEK, OCTOBER 8th–13th.

Chairman Anton Hogstad has announced that this year marks the tenth annual observance of the National Pharmacy Week movement, a movement that has accomplished a great deal in bringing the message of Pharmacy to members of allied professions as well as to the laity. In addition, it has served as a means of arousing many pharmacists to greater achievements along professional lines, all of which speaks well for the fine support it has received. It is hoped that the 10th annual observance will far eclipse any previous observance. The Grand Prize of this year will be known as the "Robert J. Ruth Memorial Trophy."

OFFICERS OF STATE ASSOCIATIONS—CONTINUED.

CONNECTICUT.

Connecticut Pharmaceutical Association held its annual meeting in New London. A midwinter meeting will be held in Hartford. The following officers were elected for the ensuing year: *President*, William J. Coughlin, West Haven; *Vice-Presidents*, William J. Cody, Bridgeport; Joseph A. Murphy, Middletown, and Ernest A. Opperman, Torrington; *Secretary and Treasurer*, P. J. Garvin, New Haven.

MAINE.

The Maine Pharmaceutical Association held its sixty-seventh annual convention at the Belgrade Hotel, Belgrade Lake, June 27th to 29th. The Maine Cosmetic bill was freely discussed by proponents and opponents. The officers were reëlected for the ensuing year: *President*, Burton K. Murdock, Kennebunk; *Vice-Presidents*, Ralph A. Lockhead, Auburn; Horace T. Poland, Damariscotta, and Ralph H. Trecartin, Phillips; *Secretary*, James H. Allen, Waterville; *Treasurer*, George O. Tuttle, Portland.

MICHIGAN.

Michigan held its annual meeting in Pontiac, June 26th–28th, and registered a successful convention. The following officers were elected for the ensuing year: *President*, James E. Mahar, Pontiac; *First Vice-President*, Ben Peck, Kalamazoo; *Second Vice-President*, Joseph Maltas, Sault Ste. Marie; *Treasurer*, Henry Hadley, Benton Harbor; *Secretary*, Clare F. Allen, Wyandotte.

MONTANA.

Montana Pharmaceutical Association met in Helena, July 23rd–24th. An anti-peddlers' ordinance was endorsed. Dean Charles E. Mollett was one of the speakers. The following officers were elected for the ensuing years: *President*, Emil Schoenholzer, Billings; *First Vice-President*, George W. Sparrow, Anaconda; *Second Vice-President*, Charles McFarland, Helena; *Third Vice-President*, Walter Clark, Havre; *Treasurer*, C. A. Challman, Hobson; *Secretary*, J. A. Riedel, Boulder. Anaconda was named as the meeting place for 1935.

NEW HAMPSHIRE.

New Hampshire Pharmaceutical Association elected the following officers: *President*, Leo L. Desparte, Lebanon; *First Vice-President*, George Moulton, Peterboro; *Second Vice-President*, William Ryan, Keene; *Third Vice-President*, Lawrence E. Cate, Rochester; *Secretary*, Rodney A. Griffin, Franklin; *Treasurer*, Edgar E. Goulet, Manchester.

OKLAHOMA.

Oklahoma Pharmaceutical Association elected the following officers: *President*, Coleman Davis, Seminole; *First Vice-President*, Cecil Carter, Shawnee; *Second Vice-President*, W. R. Franklin, McLoud; *Secretary*, Elbert R. Weaver, Stillwater; *Treasurer*, G. C. Cooper, Vian.

Prof. Anton Hogstad, Chairman of the National Pharmacy Week Committee, conducted a professional pharmacy program, which created general interest.

OREGON.

The forty-fifth annual meeting of Oregon Pharmaceutical Association was held at Gearhart, July 9th–11th. A larger number of retail pharmacists than usual were in attendance. "Fair Trade" and "No-Peddling" bills were favored. The following officers were elected for the ensuing year: *President*, Roy A. Perry, Portland; *Vice-President*, John F. Allen, Corvallis; *Secretary*, Charles I. Clough, Tillamook; *Treasurer*, Louis Larson, Portland.

RHODE ISLAND.

The sixtieth annual meeting of Rhode Island Pharmaceutical Association was held at the Ocean House, Watch Hill. The principal speaker was Dr. Dennet L. Richardson, superintendent of Public Health. Clarence A. Vars of Westerly was elected *President* and James J. Gill was continued as *Secretary and Treasurer*.

SOUTH CAROLINA.

South Carolina Pharmaceutical Association met in Charleston, June 20th–21st. An open forum on business and professional subjects was the order of the day. The following officers were elected: *President*, L. E. Bishop, Laurens; *First Vice-President*, J. D. Ashmore, Greenville; *Second Vice-President*, Samuel B. Mitchell, Sr., Sumpter; *Third Vice-President*, Carson Luther, Hartsville; *Secretary-Treasurer*, J. M. Plaxco, Due West. *Executive Committee:* Hilton Ratteree, Rock Hill; W. L. Steissegger, Charleston.

SOUTH DAKOTA.

The South Dakota Pharmaceutical Association met in Brookings. There was an open protest against the sale of grocery items in drug stores.

The following officers were elected: *President*, George Lloyd, Spencer; *Vice-President*, L. A. Daniels, Sioux Falls; *Secretary*, Rowland Jones, Jr., Gettysburg; *Treasurer*, F. S. Bockhoven, Clark.

TEXAS.

Texas Pharmaceutical Association held its annual session at Mineral Wells. The officers of the Association were installed by Dean W. F. Gidley as follows: *President*, A. H. Seeley, Belton; *First Vice-President*, C. C. Harris, Houston; *Second Vice-President*, B. B. Brown, Dallas; *Secretary-Treasurer*, Walter D. Adams, Forney. *Executive Committee*, Shine Philips, Big Spring; H. P. Gaddis, Cotulla; J. P. Frazier, Fort Worth.

Lee Stinson who presided over the sessions was presented with a loving cup. Former president Edna Gleason, of California Pharmaceutical Association, was one of the speakers of the convention; she received from William Ochse as a memento of her visit a 44-caliber pearl-handled revolver, with lessons in the art by Walter H. Cousins.

UTAH.

The following officers were elected: *President*, John E. Booth, Spanish Fork; *First Vice-President*, J. W. Christenson, Provo; *Second Vice-President*, Fred R. Elledge, Salt Lake City; *Secretary*, George F. Flashman, Salt Lake City; *Treasurer*, June W. Clark, Ogden. *Executive Committee:* John E. Booth, *Chairman*, J. W. Christenson; George F. Flashman.

Taxes, new and old, were also subject to much discussion. It was unanimously agreed to adopt the "manufacturer's wholesale list price per dozen" provision for the State code to replace the original minimum price provision of "cost plus 15 per cent." Further it was decided to add a 10 per cent mark-up for labor in Utah and to ask the Governor to sanction such a provision.

VERMONT.

The Vermont Pharmaceutical Association which met in Fairlee, June 17th–19th, was unusually well attended. A proposed federation of state associations was discussed, plans set in motion for a fair trade law, and the code came in for its share of attention. The following officers were elected: *President*, H. E. Coleman, Barre; *First Vice-President*, George T. Donovon, Fair Haven; *Second Vice-President*, Joseph W. Blakely, Montpelier; *Third Vice-President*, Fred W. Wheeler, Springfield; *Secretary-Treasurer*, Welcome B. Eastman, St. Johnsbury.

WASHINGTON.

Washington Pharmaceutical Association held its annual meeting at Olympia. A new plan of organization for the Association was adopted. Approval was given to a joint meeting in Portland with Oregon Pharmaceutical Association. The following officers were elected for the ensuing year: *President*, Charles G. Ajax, Seattle; *Secretary*, Harry W. Ayres, Seattle; *Treasurer*, Walter H. Hinman, Seattle; *Board of Managers:* L. D. Bracken, Seattle; Frank R. Robertson, Spokane; George A. Todd, Tacoma; R. M. Ragsdale, Wenatchee, and Graham A. Condie, Seattle.

WISCONSIN.

Wisconsin Pharmaceutical Association met in Fond du Lac, June 19th–21st. It was decided to hold a winter convention as well as a summer one, and a committee was ap-

pointed to report back on the State code at that time.

The following officers were elected: *President*, S. H. Dretzka, South Milwaukee; *First Vice-President*, Ed Schweger, Green Bay; *Second Vice-President*, Karl J. Henrich, Superior; *Third Vice-President*, William Hoeschler, La Crosse; *Secretary*, Jennings Murphy, Milwaukee; *Treasurer*, B. F. Leidel, Milwaukee.

It was reported that during the year the association membership had increased one hundred per cent.

WYOMING.

Wyoming Pharmaceutical Association met in Casper, June 25th–26th. The meeting was the largest in the history of the Association. The code came in for its share of discussion. Casper was chosen for the 1935 convention.

The following officers were elected: *President*, George R. Arnold, Thermopolis; *First Vice-President*, H. H. Cordiner, Laramie; *Second Vice-President*, Rock Springs; *Secretary-Treasurer*, John B. Tripeny, Casper.

MANUFACTURING CHEMISTS ASSOCIATION OF THE UNITED STATES.

The Manufacturing Chemists Association of the United States met in the sixty-second annual convention in New York City.

The following officers were elected: *President*, W. B. Bell, New York City; *Vice-President*, E. M. Allen, New York City; George W. Merck, New York City; *Treasurer*, J. W. McLaughlin, New York City; *Secretary*, W. N. Watson, Washington, D. C.

ANNUAL CONVENTION OF AMERICAN PHARMACISTS ASSOCIATION.

A NATIONAL ASSOCIATION OF EMPLOYEE PHARMACISTS.

The convention of the American Pharmacists Association was held in San Francisco, August 1st–4th. Among the speakers of the convention were John Culley, Edna Gleason, G. H. Frates, former presidents of California Pharmaceutical Association.

N. A. R. D. IN NEW ORLEANS.

The New Orleans Association of Commerce is giving publicity to attractions and history of the interesting city where the National Association will hold its annual convention, September 24th–29th.

Fifty-two of the architectural treasures New Orleans has saved from historic days of long before the Civil War are being recorded, photographed and sketched in detail for posterity by the Historic American Buildings Survey being conducted by the United States Government in Louisiana.

Fourteen of the projects in New Orleans and vicinity have been finished. They include the home of Gen. P. G. T. Beauregard, the Archbishopric, the Mississippi Valley's oldest building, built in 1734; the original Spanish Customs House; the Cabildo, seat of the Colonial government; the Presbytere, companion of the Cabildo; the old Spanish Arsenal; the René Beauregard house at Chalmotte, the field of the Battle of Orleans; the original Louisiana State Bank building; the Girod House, built as a refuge for Napoleon; the House of the Daughters of 1812; Jackson Square; the Barbarra House and Garconniere at St. Rose; Ormond Plantation; Angelina Plantation, Mt. Airy.

LEGAL AND LEGISLATIVE.

NEW JERSEY REQUIRES POISON LABEL ON DI-NITRO-PHENOL.

In order to safeguard the public and to warn prospective users of its toxic properties, it will be required in the State of New Jersey that all preparations of Di-Nitro-Phenol, as well as the chemical itself, must be labeled "poison" under the provisions of Schedule A of Section 6 of the Pharmacy Act, and that sales of this chemical and preparations containing it must be registered. The requirements for selling poisons listed in Schedule A are as follows: "It shall be unlawful for any person in this State to sell or deliver to any minor under twelve years of age or to any persons known to be of unsound mind or under the influence of liquor, any of the substances enumerated in Schedule A or Schedule B appended to this section or any other poisonous drug, chemical or medicinal substance.

PETITION TO TERMINATE THE EXEMPTION GRANTED IN PARAGRAPH III OF ADMINISTRATIVE ORDER X-36.

WHEREAS Administrative Order No. X-36 in Paragraph III exempts from required payment of Code Authority assessments, those members of the Industry who are engaged in some other line of business, which business is their principal line of business, and which Paragraph reads as follows:

"Pending determinations by NRA with respect to specific Codes upon cause shown by a Code Authority or otherwise, every member of a trade or industry is hereby exempted from any obligation to contribute to the expenses of administration of any Code or Codes other than the Code for the trade or industry which embraces his principal line of business, provided that he shall submit such information and comply with such regulations with respect to such exemption as NRA may require or prescribe."

The Code Authority for the Soap and Glycerine Manufacturing Industry petitions that the Administrator terminate the exemption granted in Paragraph III of Administrative Order X-36 except as to members of the Soap and Glycerine Manufacturing Industry.

The Administrator has given notice that any criticisms of, objections to, or suggestions concerning said Amendment, Budget and Basis of Contribution and Application for Termination of Exemption under Administrative Order No. X-36 must be submitted to Deputy Administrator Joseph F. Battley, Room 4527, Department of Commerce Building, Washington, D. C., prior to Monday, August 20, 1934, and that the Administrator may approve said amendment, said budget and basis of contribution and termination of exemption in their present form and/or such form, substance, wording and/or scope as they may be revised on the basis of criticisms, objections or suggestions submitted and supporting facts received pursuant to this notice, or other consideration properly before the Administrator.

BOOK NOTICES AND REVIEWS.

A Textbook of Organic Chemistry. By JOSEPH SCUDDER CHAMBERLAIN, Ph.D., Professor of Organic Chemistry, Massachusetts State College. Published by P. Blakiston's Son and Company, 1012 Walnut Street, Philadelphia, Pa., 1934. Third edition revised, XXV + 873 pages. Price $4.00.

This book is a textbook of organic chemistry for undergraduate students. In its method and order of treatment, the volume is an expression of the author's many years of experience teaching organic chemistry to students—most of whom plan to take up chemistry as a profession. The subject matter is presented in a sufficiently elementary manner so that it is not beyond the grasp of the student in his first course in organic chemistry, and at the same time, the work is made sufficiently comprehensive to cover the whole field by taking up most of the important compounds.

In effecting a revision for the third edition, the author has condensed the book by about two hundred pages. This was done by creating a part III under the title "Supplementary Topics." The content of this part is not new but has simply been transferred from preceding pages in earlier editions. Part I treats of acyclic or aliphatic compounds; Part II treats of cyclic compounds; and Part III treats of such subjects as: Petroleum, industrial sugar and cellulose, amino acids and the constitution of proteins, coal tar, reactions of diazo compounds, dyes, terpenes, uric acid and alkaloids. This arrangement was adopted to enable teachers to restrict the portion actually covered in class-room teaching to the first two parts and use the supplementary topics for additional study when desirable. A revision of portions of the text has been made to bring in modern theories and the latest researches in carbohydrate chemistry. The chemical and physical conditions under which reactions take place have also been added where previously omitted.

An especially valuable feature of this text is a comprehensive classified reference to laboratory preparations in organic chemistry which is placed in the appendix. This compilation contains references to the methods of preparation of organic compounds in about twenty-seven of the better known laboratory guides of organic chemistry. This scheme makes it possible to ascertain readily where to find the

specific details of procedure for the preparation of a great number and variety of compounds.

One might criticize the omission of certain important medicinal compounds from the text, such as epinephrine, ephedrine, tribromethanol, calcium gluconate and thryoxin. The book is not written from a pharmaceutical viewpoint, however, and the author does not claim to have treated of all compounds or even all groups of compounds. A sufficient number and variety of compounds and groups of compounds is considered to give the student who studies all of the text a sound basis for further study and a comprehensive knowledge of the most important relationships and compounds or groups of compounds representing the immense field of organic chemistry.—GLENN L. JENKINS.

Nos Plantes Medicinales de France. Another set of these beautiful cards has been published: there are eight cards in the set—$7^1/_2$ by $5^1/_4$ inches and the price of the set is three francs. Address your order to L'Office National des Matiéres Premiéres, 12, Avenue du Marne, Paris. The illustrations depict the plants or parts of them with remarkable resemblance enabling one to recognize the plant in nature. The backs of the cards give information relative to the plant, its botany, pharmacognosy, uses and names of plants in a number of languages—French, English, German, Italian, Spanish. Chart 81 illustrates the cork-tree, method of gathering the bark, the leaves, flower and fruit, and explains its uses. This set includes the following: Blackberry, Hazel, Bearberry, Barberry, Squill, Poppy, Rosegeranium and Parietary.

PRESCRIPTIONS, MEDICINES AND HOSPITAL SUPPLIES REPRESENT OVER 50 PER CENT OF DRUG STORE SALES.

According to Frank A. Delgado, Chemical Division, Department of Commerce, over 50 per cent of the sales of the 58,258 drug stores in the United States are devoted to prescriptions, drugs and patent medicines, rubber goods, surgical and hospital supplies and other products associated with the professions of medicine and pharmacy and the preservation of public health. Details of drug store receipts are shown in the following table, broken down into 34,844 drug stores with soda fountains, 23,414 drug stores without soda fountains and 58,258 drug stores with and without fountains.

Public Health Items and Service:	With Fountain. Million $.	With Fountain. %.	Without Fountain. Million $.	Without Fountain. %.	All Drug Stores. Million $.	All Drug Stores. %.
Prescriptions	106	9.2	101	18.6	207	12.2
Drugs, Patent Medicines, etc.	356	31.0	219	40.4	575	34.0
Hospital and First Aid	21	1.8	19	3.5	40	2.4
Rubber Goods	21	1.8	15	2.7	36	2.1
Toiletries:						
Toilet Articles	34	3.0	19	3.5	53	3.1
Toilet Preparations	95	8.3	65	12.2	161	9.5
Soda, Candy, Tobacco:						
Fountain	234	20.4	...	..	234	13.8
Bottled Beverages	6	0.3	1	0.2	7	0.4
Tobacco	160	13.9	42	7.7	202	12.0
Confectionery	46	4.0	10	1.9	56	3.3
Other:						
Stationery, Books and Periodicals	21	1.6	12	2.2	33	2.0
Sundries and Miscellaneous	49	4.3	28	7.1	87	5.2
Total Sales	1149	99.6	531	100.0	1691	100.0

These figures have been compiled from a report entitled Drug Retailing, one of a series of special trade studies prepared from data assembled in the first nation-wide Census of Distribution by the Bureau of the Census. The report brings together, in one bulletin, much of the available information on the operation of drug stores and in addition is supplemented by certain pertinent facts about competing stores.